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a magazine for Shooters by Shooters

Precision SHOOTING

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COVER PHOTO

Two-time and 1963 Champ Paul O. Gottschall (right) from Salem, Ohio, presenting the massive WHELEN TROPHY to 1964 National Champion with unrestricted Bench Rest Rifle Homer L. Culver from Arlington, Virginia, at the finish of four days shooting on the John Zink Range, near Tulsa, Oklahoma, in September.

U. S. OLYMPIC RIFLEMEN WINNING MEDALS

In addition to Gary Anderson's gold medal and new world record of 1153 in the 300 meter event, Sgt. Martin Gunnarsson took the third place bronze medal in the same event.

One brief paragraph in one newspaper report I have seen indicated that Lones Wigger and Tommy Pool won silver and bronze medals "in a shooting event"—the only mention of shooting that I have seen in the newspapers we get. There were no details but I presume the medals were won in a smallbore event.

We'll hope to have a story on our teams' successes in the December issue.

PHT

MID-WINTER SMALLBORE AT "ST. PETE"

The long-popular Mid-Winter Smallbore Rifle Tournament at St. Petersburg, Florida, which was revived after a lapse of several years, last March, will be held again in March 1965. The 1965 tournament will program a 4800 point prone aggregate and an 800 point 4-position aggregate.

Programs for the 1965 tournament may be obtained after December 1st from H. E. Evans, Secretary of the Sunshine Rifle & Pistol Club, at 4829—12th Avenue N., St. Petersburg, Florida.

1965 GUN DIGEST

The GUN DIGEST, edited by John T. Amber, keeps getting bigger and bigger—the 1965 edition, like the 1964 edition, has 386 pages packed with a variety of information from which anyone with any interest in guns will find some information of interest.

There are eight articles of special interest to riflemen, five of particular interest to handgunners, and four on subjects of interest to both riflemen and handgunners. The shotgun shooters are well served. There are historical articles, chapters devoted to hunting various game species and dope for the collectors.

There is the usual complete "showcase" of handguns, rifles and shotguns, new and old, domestic and foreign, plus loading and shooting equipment and accessories.

It is a good book and well worth its \$3.95 price tag. It may be obtained from dealers or directly from the publishers, THE GUN DIGEST COMPANY, 4540 W. Madison Street, Chicago, Illinois 60624.

Bull-Session Stuff

REMINGTON 721 FOR TARGET RIFLE

Dear Phil:

You speak about "bull-session stuff"—well, here is some. I have thought about bringing it up before but then decided that it just wasn't that important. But then, a bull-session is something different!

Why don't more big-bore shooters choose the Remington action when they have a rifle made up? I am not a widely traveled shooter but in my local area shoots I have yet to see a Remington, besides mine, on the line. This summer at Perry I kept my eye open in the hopes of seeing another Remington but I was not rewarded with success.

The benchrest shooters have pretty well indicated the accuracy attributes of the 722 action. The 721 has much the same to be said for it. It is a stiffer action. It is easier to bed properly. It tends to stay put better. It has a most excellent factory trigger. The lock time is very fast. It is a most safe action.

Now I have heard people say that the extractor is poor, it lacks clip slots, and the magazine doesn't hold enough shots. Over the years that I have fired my rifle, a 721, in competition and out, I can recall two malfunction situations and in each case I would blame my improper care of the rifle. One of these malfunctions was with the extractor, but it occurred because I allowed the extractor to rotate until it did not let the ejector operate. Remington used to depend upon a bit of peening in the extractor groove to prevent this. I had inadvertently removed this to an extent. If I recall correctly, their extractors are held with a pin in the later models. But, I have never had this trouble since and don't anticipate it again.

My second malfunction was at Perry this summer. As you know, it rained like the dickens the first few days. I had left some soldering flux in my magazine box and thus rusted. The sharp lower lip of the bullet follower caught on this and fouled up my rapid fire. Live and learn. Otherwise no problems.

At the most the clip slots are a 45 minute operation with some Swiss files. At least it didn't take me any longer than that. They work just fine.

The five-shot magazine is no trouble at all if it is figured into the stock construction. And this isn't as much as it sounds for the dimensional thickness is hardly more than the dimension of what comes through from the factory in their stocks.

To my knowledge my rifle has never changed zeros. I stocked it with a good piece of maple and glass bedded the action plus the first two and a half inches of the barrel. The rain poured into the works at Perry but it never phased the weapon a bit as far as zeros were concerned. The rifle held up its end perfectly. I disassembled it at Perry to fix the magazine trouble that I mentioned. Upon assembly it shot right on the button—same zeros, and right from the start. No settling in problems.

Some say the bolt handle is short for good rapid fire work. Perhaps, but it has never bothered me a bit. I can easily lengthen the handle but have never felt inclined to do so with my weapon.

So, I feel that the advantages far outweigh the disadvantages. In my opinion many people are missing the boat. Because they don't see other Remingtons on the line they get the opinion that a Model 70 is the only suitable commonly available action.

I had the time of my life at Perry and hope that I can make it a yearly trek. I never realized what terrific fun I was missing.

Dale F. Rowe
5 Bullard St.
White River Jct., Vt. 05001

A NEW METHOD

An entirely new method of making extremely accurate internal ballistic measurements has been developed. Dr. Lloyd E. Brownell at the University of Michigan and associates have achieved a notable breakthrough using nuclear radiation.

The new method does not have the disadvantages and limitations of those presently being used. Furthermore, measurements can now be made which were heretofore impossible to obtain. For example, velocity, acceleration and relative pressure data can now be obtained from the same test firing.

The new method is explained in the July-August, 1964, ORDNANCE magazine. Copies of this magazine may be obtained by writing the American Ordnance Association, Transportation Bldg., Washington, D. C. 20006.

Lt. Col. John H. Dougherty
Rose Polytechnic Institute
Terre Haute, Ind. 47803

CAST BULLET ACCURACY

I still do not agree with Col. Harrison about the Squibb bullet. He still drops the Squibb at velocities over 1300 feet per second. I don't believe his reloader knows how to reload.

My service rifle was giving me smaller groups than my heavy Springfield, so I decided it was time to get a new barrel. I got a Douglas barrel about a pound lighter than former barrels, the present outfit weighing only fourteen pounds without the telescope.

They say you have to shoot a few rounds through a new barrel before it will start to group. Such was the case. The first groups were rather discouraging, but after a while it settled down.

I am using a harder bullet: 9% Antimony, 5% Tin and 86% Lead. Weight without gas-check is 158 grains. At 100 yards bench rest I made the following groups: 1½"—1½" (with 8 in ⅞")—1¾"—1½"—2"—1½"—1¼" (with 9 in ⅞")—⅞". Groups measured center-to-center of bullet holes. That ⅞ inches is the smallest I have ever made at 100 yards with 10 shots. Load was 23 grains 4198. Velocity 1750 feet per second.

Dropping back to 200 yards, load of 45 grains 4831, velocity 2100 feet per second, groups were: 5" (9 in 3")—4¼" (7 in 2½")—3¾" (6 in 2½")—3½" (8 in 2½").

Dropping down prone I made a pair of 95's on the Standard American target. The twenty shots made a five inch group.

I made .30 cal. Expert after I was 81. That makes 36 years qualification as Expert. How many men can do that?

Alfred K. Friedrich
17474 Ehle Street
Castro Valley, Calif.

(Editor's comment: I have corresponded off-and-on with Mr. Friedrich for quite a good many years. He has been Secretary-Treasurer of the Oakland Rifle Club, Inc. for many years, and still is. He has done an immense amount of work in Junior instruction and developed some fine young shooters. He was at one time active in the Scheutzen type of offhand shooting. Last winter he competed in a couple of John Sweany's "Hunting Rifle Matches" (bench rest), shooting his 30/06 rifle with IRON SIGHTS. He didn't win any prizes but he was quite a long way from the bottom of the ranking list.)

PRIVATE RANGE AVAILABLE

I could not find any place in this great State (Florida) where any bench rest matches are held. So, I had a man with a big blade on his tractor scoop up a hill of sand for a back-stop on my three acres here in Floral City.

The man who reloads my 22/250 cartridges also got the bug and shoots with me. He is very meticulous and we found that 31 grains of Ball powder and the 50 grain Sierra bullets makes Betsey shoot

where she should. The rifle is made of a Douglas Bull Barrel, a Mauser action and 15X Lyman scope—weight 15 pounds.

I found I had to fire at least 3 or 4 shots to clean the Hoppe out of the barrel or my first shots would go hay-wire—an inch or so off. Lately I discovered if I ran two dry patches through the barrel and then soak a couple of patches in wood alcohol, did the trick, and I saved 30 to 40 cents thereby.

I have made several $\frac{3}{8}$ inch groups at 100 yards and just lately made one group of 7/32, all touching. This pleased me greatly. We use sand bag rests and the range faces north, which is fine on a bright and sunny day.

If any of your readers would like to use my range at any time I would be pleased to meet them—with only one stipulation—not before 9:30 A. M. as this is the crack of dawn for me, who gave up early rising when I retired 14 years ago.

H. Ehlenberg
Floral City, Florida

INFORMATION DESIRED EXCERPT FROM A LETTER

There are a couple of things I'm curious about, and perhaps some of your readers could help me. In all references I have seen to bulletmaking, the would-be bullet-maker is advised to buy the best commercially made (lead) wire he can. Now, it seems to me, what with the high transportation costs, high basic price, and occasional inaccessibility of wire distributors, that some hardy souls would have tried to extrude their own lead wire from scrap. In fact, given the immense collective knowledge, number of machine tools and knowledge to use them, and spirit of hardy individualism possessed by the readership of *Precision Shooting*, it would seem inconceivable that some of the boys haven't tried extruding their own wire from carefully chosen scrap. Being a scavenger myself and a fairly experienced bullet caster, I know it is quite possible to buy pure lead fairly cheaply, if one knows what he is looking for and has the strength of character to avoid interesting looking masses of unknown composition. After the lead has been cleaned and fluxed, we arrive at the important point of departure in method; whether to swage hot or cold. Most of us don't have access to the really large presses necessary to cold-extrude sizeable quantities of lead wire; hence, it's a matter of making it in comparatively small pieces or hot-working it.

It is the hot-working process that I'm really curious about. Like many others, I have seen nozzle and frame apparatus advertised for use with a small hydraulic jack and gas torch. The February 1962 PS, in fact, pictured and reviewed such apparatus. Moreover, I have heard of at least one other homemade rig powered by one or two men on the end of a long lever arm. The point I am trying to make, however, is that such gadgets can conceivably be made at home (or shop). Aside from the practical side, what I would now like to know is how good their product might be.

From an accuracy standpoint, has anyone had enough conclusive experience with home made bullets whose cores were made from hot-extruded wire to be able to say whether there is a significant difference in accuracy between them and cores made from cold-extruded wire? I have heard the statement made that there are different densities present in similar volumes of the hot-extruded wire, presumably attributable to variations in compression of the lead. I have never heard a full and scientific explanation of this phenomenon or any evidence connected with it, but I would greatly appreciate hearing the experiences of anyone, including the commercial bullet companies, who has worked with hot-extruded lead wire, or who has devised practical means for making it.

(Continued on Page Fifteen)

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I certify that the statements made by me above are correct and complete.

P. H. Teachout, Editor

DROSS AND FLUXES

A. J. Hammer, E. B. A.

The article by Fred W. Hallberg on LEAD, which appeared in the May 1964 issue of Precision Shooting, raised several questions about dross and fluxes which were of interest to this writer and are probably of interest to other hand loaders.

When working up scrap lead from wheel weights, lead sheet, lead pipe, etc., it has been observed that after the metal has been allowed to cool in the pot, there is frequently a coating of powdery material remaining on the inner surface of the pot, and adhering to the ingot. This material has a density considerably less than the density of lead and would be expected to float to the top of the metal where it can be skimmed off.

It is difficult to say what the composition of this powdery material is since it would vary with the source of the scrap lead. Wheel weights, for example, are frequently covered with a thin layer of grease or oil to which dust, dirt, and other mineral-like materials will adhere. Scrap lead from drain pipes and traps frequently contains residues from soap, detergents, hard water, cooking greases, etc. Also, lead and its alloys are always covered with a thin layer of oxides.

The powdery material from these kinds of scrap lead would probably contain a considerable amount of carbon due to incomplete oxidation of the grease and oil and other carbon-containing materials, at the temperature used for melting the metal.

Lead drain pipe and traps sometimes are lined with a layer of lead carbonate and lead hydroxide, both of which are white. Both of these compounds are converted to lead oxide when heated to a temperature slightly above the melting point of lead. The dross from this kind of scrap lead would be expected to be yellowish in color, due to the preponderance of lead oxide.

Not long ago the writer worked up about 500 pounds of scrap sheet lead from the lining of a tank. The lead had been painted with a crude type of tar and evidently had been exposed to the wind which carried a considerable amount of sand to the surface. When this scrap was being worked up, most of the tar burned off but a considerable amount of dark colored residue remained between the inner surface of the pot and the ingot. Some of this could be brought to the surface by scraping the surface of the pot under the molten metal, but after the ingots had cooled and removed from the pot, each one had to be washed with a stream of water from a garden hose to remove this powdery material. Even after this treatment, some of the larger fragments were found imbedded in the ingot. These could only be removed by a second melting.

The reason that this powdery material remains between the inner surface of the pot and the molten metal appears to be due to the fact that it is nonmetallic in character and is not wet by the molten metal. The pressure of the molten metal is sufficient to hold the powder against the surface of the pot. If it is scraped away from the surface of the pot, thus allowing the molten metal to get between the powder and the pot, then the powder floats to the surface.

The Government Printing Office* classifies dross under two headings. First, that which is on or in the metal before melting and second, a dross which is the result of oxidation of the essential constituents of the metal while molten.

When working up scrap metal, the greater part of the dross or skimmings would be that which is in or on the metal before melting but when blending alloys and metals which have been cleaned by previous melting and fluxing, or when casting bullets, the dross will be almost entirely a mixture of the oxides of the essential constituents of the bullet alloy, plus a considerable amount of the alloy. In a dross skimmed below 600°

F. from type metal without flux, the major constituent of the dross will be fine metal shot (called shotted metal by the printer) which may be present to the extent of 80% of the total weight of the dross. This appears on the surface of the metal as a "mushy" layer. The purpose of the flux is to permit the oxides to separate from the metal shot where they may be skimmed off, and the metal shot returned to the bulk of the metal in the pot.

The chemistry of dross formation is quite complex and involves such factors as the composition of the alloy and the temperature at which the dross is formed. The problem is further complicated by the fact that lead, tin and antimony each forms more than one oxide and some of these oxides may be partially reduced to metals by other metals in the molten alloy.

The following experiment was done to determine the amounts of tin, antimony and lead which are lost as dry dross** from several bullet alloys. A temperature of 750° F. was used during the accumulation of the dross and, in order to accelerate the formation of the dross, compressed air was forced through the molten alloy. After a considerable amount of shotted metal had collected, beeswax was added as a flux. The metal and dross were fluxed and stirred several times in an attempt to prepare a dry dross which was free from shotted metal. This was only partially successful as will be shown in the results of the experiment.

A small amount of metal was always removed with the dry dross, in spite of attempts to prevent it. The mixture of dry dross and metal was then placed in a 100 mesh sieve. It was assumed that the material that passed through the sieve would be composed of oxides of the metals only, and would be free from metal particles. The chemical analysis indicated, however, that the dry dross samples contained metal. A microscopic examination of the dry dross showed that it contained small spheres of metal, in addition to the oxides, even though it had been passed through a 100 mesh sieve.

Although the dry dross appeared to be free from flux, samples were tested with benzene and found to contain small amounts of beeswax which had not completely burned off during fluxing. Each sample of dry dross was then extracted with benzene several times and then heated at 750° F. for one hour to remove the last traces of beeswax.

The following table shows the composition of the alloys and of the dry dross from each alloy.

	% Tin	% Antimony	% Lead
Alloy	4.04	11.57	84.39
Dross	6.05	11.56	81.90
Alloy	5.55	5.43	89.02
Dross	6.72	5.20	88.12
Alloy	1.94	2.60	95.56
Dross	4.33	2.47	91.23
Alloy	0.07	5.30	94.63
Dross	0.50	15.83	75.60
Alloy	5.28	0.31	94.41
Dross	6.58	0.34	92.44

The values for the lead contents of the alloys in the above table were obtained by difference since the alloys contained only the three metals, tin, antimony and lead. The values for the lead contents of the dry dross samples are the results of chemical analysis.

The color of a dry dross varies with its composition and the temperature at which the dross is formed. Dross from type metal has a dark color when produced at low temperatures and a yellow color when produced at high temperatures. In the presence of the small amount of wax, oil or grease which may remain in the dry dross after fluxing with one of these materials, all dry drosses are quite dark, or even black in color.

Pure lead oxide (92.8% lead) is yellow, tin oxide (88.1% tin) is gray to black and antimony oxide (83.5% antimony) is white. Because of the preponderance of lead oxide in dry drosses from bullet alloys, this accounts yellow to reddish yellow color of the deposit which often accumulates on the inner surface of a melting pot.

A number of experiments have been done by the Government Printing Office to determine which of several fluxes was the best for fluxing type metal. The materials tested were light machine oil, mutton tallow, Japan wax, lard oil, castor oil, beef tallow and palm oil. There was no appreciable difference in the amounts of dry dross obtained with these materials, the percentage of dry dross varying from 0.78% to 0.88%. There appeared to be a slight correlation between the amount of dross obtained and the flash point of the flux, those with higher flash points producing a slightly larger amount of dross.

Similar experiments have been done in Europe where wood charcoal, cylinder oils and pine wood were used. One of the oils was found to be best in these experiments.

The manufacturers of solders have been interested in the mechanism of the flux action and have carried out a number of studies in attempts to explain the action of fluxes in soldering. Their interest is from a different point of view from those using fluxes when casting lead alloys but they do have one interest in common, that of separating oxides from metals. The following is quoted from a booklet on solder published by the Kester Solder Company. "It is believed that the flux first exerts a slight reducing action which loosens the trapped oxides on the metal surface; the loosened oxides, when wetted by the flux, are coagulated and suspended in the flux body, thus enabling the pure metal surfaces to make contact."

When fluxing dross on type metal or a bullet alloy, the flux loosens the oxides on the spheres of metal (shotted metal), allowing the small spheres to congeal into larger spheres which, during the stirring of the metal, can unite with the metal in the pot. The oxide layer on the small spheres acts as a protective coating, preventing the small spheres from congealing.

Statements have been made in the literature on bullet casting that the purpose of fluxing is to reduce the oxides in the dross to metals. It is true that all of the oxides of lead, tin and antimony can be reduced to metals with carbon, provided the temperature is high enough. In some cases, this reduction requires a red heat (1200 to 1400° F.). It is doubtful if more than an insignificant amount of the oxides in a dross from a bullet alloy are reduced to metals during the fluxing of these alloys at the temperatures usually used in bullet casting.

In order to test this idea, portions of the pure oxides of tin (88.1% tin), lead (92.8% lead) and antimony (83.5% antimony) were placed in porcelain crucibles. Each oxide was mixed with separate portions of wood charcoal, beeswax, rosin, Ideal lubricant and sal ammoniac (ammonium chloride). The fifteen crucibles were then covered with lids and placed in a furnace, adjusted to reach a maximum temperature of 750° F. After one hour at this temperature, the crucibles were cooled and their contents examined for the presence of metals. In no case was there evidence supporting the idea that these fluxing materials reduce the oxides of lead, tin or antimony to the corresponding metals at the temperature of 750° F.

Common practice in fluxing bullet alloys in a ten pound pot is to add a small amount of the fluxing agent, usually about the size of a .38 bullet, stir and skim off the dross. It is doubtful if this is sufficient fluxing to thoroughly clean the alloy. Microphotographs by the Imperial Type Metal Company of an improperly prepared type metal showed that although the chemical

analysis indicated that the composition of the alloy was correct, there was a considerable amount of oxides dispersed in the alloy. In this condition, this alloy would be strictly analogous to muddy water and would so behave.

Removal of the dispersed oxides from type metal or bullet alloys involves repeated fluxing, stirring and skimming. It should be kept in mind that the action of the flux takes place on the surface of the molten alloy only. This means that a considerable amount of stirring is necessary to bring all of the dispersed oxides to the surface where they will come in contact with the flux.

This suggests that a fluxing agent which will remain on the surface of the molten alloy for a longer period of time will be more effective than one which vaporizes or burns off shortly after being added to the pot. For this reason, waxes would be preferred to oils.

The Government Printing Office uses a flux consisting of a mixture of equal parts of sal ammoniac, rosin and carbon black and thoroughly stirs the molten alloy with a mechanical stirrer during the fluxing operation. Of the three ingredients in this flux, both rosin and sal ammoniac help to separate the oxides from the shot metal. The action of rosin is similar to that of waxes, greases and oils while the sal ammoniac may undergo a chemical reaction with some of the oxides, converting them into the corresponding chlorides. The carbon black in this mixture appears to be for the purpose of preventing further oxidation during the fluxing operation.

The dross from type metal in print shops is saved and after a sufficient amount has accumulated, it is shipped to a refinery where the metals are recovered. The carbon black in the mixture received by the refiner would aid in the high temperature reduction process during the recovery of the metals.

The use of lye as a fluxing agent was described in the May issue of Precision Shooting. Molten lye reacts chemically with the oxides in the dross, converting them into other compounds and allowing the spheres of alloy to congeal.

*"Type Metals," GPO-PIA Joint Research Bulletin C-1, Composing Room Series No. 1, Government Printing Office, Washington, D. C.

**The term dry dross refers to the powder remaining after fluxing and supposedly consists of the oxides of the metals without any shot metal.

INTERNAL BALLISTICS—00

Edward M. Yard

Experimental Ballistics Associates

This is the first, and a preliminary one of a series of monographs on the topic of Internal Ballistics. The purpose of writing them is to educate ME. Some degree of inexperience in these matters, will, we hope, be excused on these grounds. At the same time we trust others no better informed than we, may learn as we do. In the explaining of something complex to another, much may be learned.

Internal Ballistics is a study of what goes on inside a gun. To most of us this is judged by the muzzle velocity of the bullet. And what does occur in chamber and bore really determines a bullet's velocity. Even though far too much emphasis is often put on mere muzzle velocity, it's very true that velocity is needed and any missile depends upon it. It is in the gun, not out of it, that the bullet gets its velocity.

Recently an interest in high velocity guns has led shooters to think that bullets travelling over 2000 F.p.s. came along with smokeless powder, or that pistols reaching 1000 F.p.s. were not possible in the black powder era. This is not so, and it simply points up the big gap in interior ballistic understanding that has crept into the shooting game. Not the fault of shooters, who may scarcely be expected to cope with technical intricacies sans help.

Knowledge of the basic facts gets put more and more under wraps.

It is our intent that these brief papers to open the book once more, to throw some light on the murky tunnel that is your gun barrel, and to get down to facts about what goes on in there. There'll be times we'll have to get pretty technical. Maybe that can be kept to a minimum. Facts are the important thing, and the more intuitive and self-evident we can make them, so much the better. That is our aim.

IT's a fact. If you slip into the woods once each year and drag out a deer, fully satisfied with your gun and shooting, this bit is not for you. Only if you wonder what some change of load or bullet type might have done. AND THEN wonder WHY this is so, then this is for you. Let's part here friends: if you're the ballistic beagle, there's a scent to follow; we'll see you hunter boys in the woods.

Let us say too that we aren't thinking of guns and ballistics in strict class room terms and texts. Guns and shooting are real. We want to stay with ideas that we can test, principles that may be put to use, and things that do not require a Pentagon connection to confirm. No point in passing along watered-down restricted info and hoping to make progress in independent thinking about small arms and ballistics. We intend, and hope to perform in this series, to bring you ideas you may put to work.

FACTS MATTER

We must have data to get anywhere. Ideas, discussion and opinion don't help unless we can tie them to a fabric of basic fact. No matter what anyone thinks of a load, it is its performance alone that counts. Where do we start???

Velocity is the key measure of any small arms load. We know the bullet diameter and its weight to begin with. But when it is shot how fast does it go. **NO WE ARE NOT** over emphasizing velocity. It is simply the fact that to know trajectory, muzzle energy, remaining energy, drop, we have to know muzzle velocity. And fundamentally a bullet is a missile only because it does have a velocity sufficient to make it effective. Size can be observed, weight may be hefted, but velocity must be measured. It is what makes those other factors count. Never misbelieve it.

The toe-hold, the beach-head, the start into a knowledge of ballistics, begins with an accurate means of measuring bullet velocity. Powder, when it explodes behind a slug, imparts to it a speed, and that is its power. This we must know, and this we must measure, for then we can know the rest of the story, can figure the other values.

Opinions vary about what is the important feature of a load for effectiveness. Most sources report Muzzle Energy, but some say Momentum is most important.

Muzzle Energy = $\frac{1}{2}MV^2$

Momentum = MV

Both depend upon velocity. The M is bullet mass, and bullets are easy to weigh (most often the maker states the weight). Velocity is the important factor to know.

Velocity, too, is the factor that amateur ballistic experimenters CAN measure to high accuracy, for no government or industry lab can now challenge the basic accuracy of the counter chronographs offered shooters. The several crystal oscillator controlled chronographs now sold to shooters put them just as much in control of their experiments as the big labs. We'll see more of how this ties in as we go along.

Right now you can buy a counter chronograph for \$100. It will be a good one. The timing will be controlled by a crystal oscillator to a small fraction of 1%. You won't be measuring anything else to near this timing accuracy. These devices

are reliable to the extent that any previous system does not compare. The condenser charging units and the pendulums, rotating disc timers, and so on ought to be forgotten. We'll talk about them later for those silly enough to be interested. ITCC, Avtron, and Herter make good counter chronographs at fair prices (in fact prices that defy competition).

GUNS ARE MACHINES

As each gun is a machine and an engine, its performance may be calculated from collected data. It will deliver work as does the heat engine. We have indicated that if velocity is known for the bullet, many other quantities may be figured.

After a few loads are velocity tested, the engine efficiency of any gun may be ascertained, and then used to check out the performance that other loads will give. Different bullets and other powders will need a separate check, but similar efficiencies may be expected, because these things change the nature of the machine very little.

The powder charge provides energy to drive a bullet out of a rifle barrel just as the fuel in a motor propels a piston. This is how they work. Powders have much potential that fuels do not. They don't need air. The full potential energy is delivered despite small cartridges. The fact that a powder fired in a closed chamber always delivers the same energy per grain weight lets us figure ballistic results.

As heat machines go, guns are pretty efficient little engines. They deliver about 30% of the fuel energy put in them to the bullet. This figure, for reasons we don't know is not too widely known by handloaders. If you never get another fact, note this one where you won't lose it (unless you have a chronograph). Most moveable heat engines don't approach this efficiency. And knowing this quantity allows rather accurate estimation of any load performance.

When a chronograph is available you may measure muzzle velocity accurately. The bullet may be weighed on your powder scale. From these known quantities Muzzle Energy may be calculated:

$M. E. = \frac{1}{2} MV^2$, in Foot Pounds

This value divided by the energy in the powder charge (also in foot pounds) will give the efficiency of that load, and a good general one for that gun. This is useful basic information. Let's say the result is 30%.

Then 30% of the energy content of some other charge will be the M. E. of that load, and we may calculate V by solving the above equation.

Should the V for some load chronograph much too low, then the powder failed to burn completely. Later we'll get into details of this sort of thing. For now, the energy did not go to work, and the efficiency was low. Note this: that powder is not suited for the load; it burned too slowly.

POWDER DATA NEEDED

The energy content of all powders to be considered will be needed to apply the above theory. Something of their burning rate will also need be known, although why is not yet clear. This is again the sort of information handloaders lack. A little bit about powder burning rates may be found in handloading manuals, placing the better known ones in an approximate order. Such information is not complete. No relative scale is normally available. How to relate even this meagre information to practical load development is lacking.

Relative heat contents for each powder sold to handloaders just isn't to be had. Some general data for all single base and all double base powders in metric units may be found. For the uses

(Continued on Page Six)

Internal Ballistics—00

(Continued from Page Five)

we are now discussing, such data is insufficient.

We have been making bomb calorimeter tests of powder energies. A sample of the values will be given in a tabulation with a future in this monograph series. Those interested in this data, wishing a complete tabulation when ready, drop P. H. T. a card requesting it. All E. B. A. will get it direct.

Random Shots

By Betty Summerall Duncan

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When the esprit de corps long associated with the United States Marines spreads over into the shooting game, it invariably provides material for the type of story which I most enjoy passing on to you. And, how appropriate that it involves the XVIII Olympiad! As the U. S. Olympic Shooting Team flew from Los Angeles International Airport just before the stroke of midnight on September 30th, 1/Lt. Lones W. Wigger, Jr., U. S. Army, had in his possession both a rifle and a symbol. The rifle is the prone-stocked Anschütz with which Warrant Officer James E. Hill, U. S. Marine Corps, captured the 1964 National Smallbore Prone Championship—symbol of Hill's team spirit. Rising above the disappointment he must have felt over not making the team, he sent the next best thing to Tokyo which he had to offer—his accurate rifle . . . Wigger plans to shoot R-50 in it, and with the fantastic luck he has had with borrowed rifles, he should be well on his way.

Processing by Olympic officials, being outfitted in uniforms, dodging as many of the gala festivities as possible, so occupied the hectic few days during which the 10-man shooting team was quartered at Los Angeles' Biltmore Hotel that it hardly afforded the most favorable climate for serious practice. Further, due to a breakdown in liaison, we were not alerted to their arrival nor their needs and the only facility approaching ISU conditions was at 300-yds. on the San Gabriel Valley Range, where they had hurriedly constructed booths. "Swede" Gunnarsson shot big bore there on Sept. 29th, while Gary Anderson, Tommy Pool, and Wigger used the smallbore range, along with a couple of the pistol shooters.

Anderson and Gunnarsson were wearing their "fancy" blue sweat suits with U. S. A. in white, red-edged letters, spelled out on the jerseys. Sounds like a fashion page, doesn't it? But read on, please . . . Relaxing over cokes following the practice session, "Gunnar" remarked that it was the first time that he had shot in his fancy suit and asked Andy if he considered that the sweat suit offered as much support as fatigues. After hearing that Anderson was wearing a pair of swimming trunks and a second sweat suit under the blue one, Gunnarsson was satisfied that he had found the reason for his not holding as well as usual.

Having read about Gary Anderson's daily 3-mile training jaunt, I took advantage of the opportunity to hear his theories on it, which I found quite interesting. "About two months before an important event, I stop running," Andy explained, "but, ordinarily, I run 2 to 3 miles daily to keep in shape and to slow down my heart action." It seems that runners in top condition, such as the Olympic dash men, have a pulse beat of about 35 per minute. Considering that 70 is average and Anderson's is 45 to 50, due to his daily run, the increase in steadiness would certainly be well worth the effort. He figures the percentage this way, "If, under pressure, my pulse beat reaches 60 or 70, I still have an edge over the shooter whose arm is vibrating at 80 or 90." Now, that makes a lot of sense, doesn't it? Especially to those of us who have bucked an important shot.

As most of you know, our World Champion is a ministerial student at Hastings College in Nebraska, which has permitted him very little opportunity for more than dry practice. This should point up the importance of being in prime physical condition, for it carried Anderson to his 36-point 300-meter lead over the field at the Olympic trials.

He confided, "I really tried hard! But, I like to shoot 300-meters and everyone doesn't."

"I think many fear it, don't you?" I suggested, to which he agreed. It could be that this subconscious fear holds them back and stymies their potential.

We arranged for Andy to practice on the ROTC gallery range at the University of California at Los Angeles. He spent all of one afternoon shooting standing, creating a flurry of excitement among the students as word spread that the World Champ was practicing . . . It is an education to watch him—a picture of relaxation—his endurance seems limitless—left-handed, he holds like a statue. Both in the gallery and outdoors, he wears the type ear muffs worn by pistol shooters. This could be a decided aid to concentration.

As Willard Neal wrote in the *Atlanta Journal-Constitution* Magazine, "A less likely candidate for such a post"—the greatest rifleman in the world—"would be hard to find . . . You hardly expect a preacher to split hairs with a rifle bullet."

Sidelights: So that you will understand why you hadn't been reading about Capt. Tommy Pool for some time prior to the tryouts, he is in the Quartermaster Corps, stationed in Germany. He came back to the States early in May to practice for the tryouts, and will return to West Germany following the Games . . . Utilizing his practice time in the kneeling position, he was using Mark III, which he will fire in his Anschütz (what else?) in Tokyo . . . To make all of our ammunition company friends happy—Anderson was using Remington in practice; however (sorry, Dan), if he shoots smallbore in Japan, he'll use R-50.

Did you know that Sgt. Martin I. Gunnarsson was born in Sweden and came to the U. S. in 1952? It was the following year that he joined the Army and began making shooting news.

According to Gary Anderson, "We have the strongest Olympic Team we've ever had." This confidence was echoed by Col. Thomas J. Sharpe, USA, Team Captain; Lt. Col. Frederick J. Keifer, Jr., USA, Adjutant (who was busily engaged painting orange streamers, which he glued on the shooting kits), and on through the team.

There was an air about our riflemen—of buoyant optimism, which appeared contagious. Yet, in their eyes was a cold determination. They'll be shooting first for Old Glory—and second, for their teammates who "also ran."

This goes into the mail on the eve of the first Olympic shooting event—the 300-meter. A postcard has just come from the team in Tokyo, which I wish that I could share with you. In vivid colors is pictured the Sacred Flame, lit in the Temple of Hera at Olympia, Greece, on August 21, 1964 and transferred to Athens. There it was taken aboard a plane, and after visiting 11 cities in 11 countries the Torch reached Naha, Okinawa on September 6. There the Flame was divided into 3 parts and sent forth to Kagoshima, Miyazaki, and Sapporo by plane. In Japan, it was carried by young Japanese runners along four routes (with an additional flame added at Aomori), in relays between main cities all over the country . . . At last the Torch arrived at the National Stadium in Tokyo for the opening ceremony of the Games on October 10, marked by pomp and splendor with the Emperor and Empress in attendance. There, the Sacred Fire, re-ignited in the Olympic

cauldron remains lit throughout the Games—as a Symbol of Peace.

On the card are three of the distinctive Olympic commemorative stamps. The message—: "Everyone is in good spirits and doing a real fine job of practicing. The Japanese have everything well organized and the ranges are beautiful."

FLASH!!! GARY ANDERSON established a new WORLD RECORD at 300-meters, scoring 1153! This wipes out the 1150 record set by Hollenstein of Switzerland at the 1963 European Championships in Oslo. Anderson also unseated Borisov of the USSR, who held the Olympic Record of 1138, fired in 1956. "Swede" Gunnarsson came through with a creditable 1136.

Meanwhile, here at home it's "business" as usual with the International set. Bill Krilling ran away with the Pennsylvania State Free Rifle Championship at Murrysville on Sept. 26-27. The shooters who fired on Saturday got a break with fairly good conditions. Those squaddied on Sunday, however, encountered very tricky wind conditions. Added to that, it became dark and rained—which was when Krilling fired. His scores were so outstanding considering the conditions that Bill modestly declares that he was "unconscious" with a 399 prone (remember, this is the ISU target!), 381 kneeling and 368 standing for an 1148-17X victory . . . Confidentially, Krilling has changed several things since the tryouts and this is the lowest score which he has fired since then . . . He recently hit 1161 and got up to 1159 the following day . . .

The competitor list is well-rounded, numbering 42 civilians and 7 military. States represented were Ohio, N. Y., Virginia, West Virginia, Md. and D. C., in addition to the 3 shooters from Lackland AFB, Texas, and 4 from USA MTU, Ft. Benning, Georgia.

John H. Writer, who battled Sunday's rough conditions along with Krilling, shot a remarkable 387 for high Kneeling score. His 1137-19X was good for High Civilian and second in the Open Aggregate.

The Pennsylvania State High Resident Champion is Robert K. Moore for his 1109-18X . . . High civilian prone score was Larry Wilkens' very fine 396-16X.

West Virginia University is going to be dynamite this year. In addition to John Writer, they have Philip D. Bahrman, who placed third in the Open Aggregate with 1126-17X and was high junior, J. R. Luh and A. J. Haloubek, both promising shooters.

The "Old Pro," Capt. Verle F. Wright, Jr., came in 4th with 1121-12X, and Ed Caygle's 1119-10X was 5th.

Jack Schweitzer fired 1085-12X to become the State Junior (Resident) Champion.

In team competition, it was USA MTU—4458-47X over West Virginia University's 4414-56X.

Kendall, Adams, Dingman, and Frazier from USA MTU have been conducting shooting clinics at various Army bases. Pres Kendall is arriving this week-end for one of those shooters' bull sessions about which Phil wrote last month . . . They will remain in Calif. for the State Int'l Matches at Richmond.

Big Bore notes from Perry—But first, a word of assurance to a certain person—you may relax; I don't plan to tell all I know . . . This is what I had in mind—it seems that during the heavy rains, if water got in the flash suppressor on the M-14, it caused the bullet to drop considerably in elevation. . . . The first four places went to M-1 shooters, but the word is that all service personnel will be shooting the M-14 by next year. The Int'l shooters fired it "cold" at Perry, but Davenport of USA MTU won the sitting match with the M-14.

Apropos of my remarks last month regarding the action of the NRA Executive Committee to retain the 3-lb. trigger rule for Nationals, regionals, and sectionals—they have kicked the Army Int'l shooters right out of those competitions!!! My prediction is that the Air Force and Marines will follow suit and boycott all tournaments requiring a 3-lb. trigger.

The Masters prone tournament held by the Wellsboro, Pa., Rifle Club on Sept. 27th went to Wayne Wood of Pitman, N. J., who edged Loren Samsel, Jr., Somerset, Pa., 2383-159X to 2382-157X. Roy Oster's 2381-148X was a close third.

This second annual event is increasing in popularity and will be even more attractive next year as strong winds kept the scores down, the record wasn't broken, and the extra prize money for that will be carried over.

With iron sights, it was Ray Wilson, Elmira, N. Y. at 50 yds.—400-28X; George Handel, Pittsburgh, 50-meters—398-27X; Richard Morgan, Luzerne, Pa., 100 yds.—395-20X. Aggregate—Wayne Wood—1187-70X; Oster—1186-64X; Samsel, Jr.—1185-67X.

Any Sight winners: 50-yds.—Samsel, Jr.—400-36X; 50-meters — Morgan—399-33X; 100-yd.—Herb Wallace, Scranton—400-32X. Aggregate: Samsel, Jr.—1197-90X, Wallace—1197-89X, Wood—1196-82X.

Pennsylvania's State Prone Championship was a close one on Sept. 12-13. Roy Oster eased out Loren Samsel, Sr. by 2X's and Loren, Jr. by 4X's—all with 3182 totals. . . . The postal team totaled 3983, fired on Sat. p. m. in—you guessed it—more windy conditions, to avoid the poor early morning light on the Washington (Pa.) range.

C. H. "Bob" Kline has been so considerate about sending Pa. news that we don't want to overlook the night match at Clarion. I would still like to see more clubs start planning outdoor night shoots for next summer. Not only would they add variety to your club program, but if the Clarion match is an indication, shooters travel many miles to attend.

The winner at 50-yds. was Loren Samsel, Sr., Dallas, Pa., with 400-38X over Bob Kline's 400-36X. Kline is from Lock Haven. . . . 14-year-old John Waver, Oil City, Creedmoored Loren Samsel, Jr., with a sensational 400-39X at 50-meters. . . . George Handel took the Dewar with a possible and 36, as Kline scored 33X's. . . . Samsel, Sr.'s 400-34X led Fred Parker of Erie by 1 X. . . . Samsel, Sr., aggregated the winning 1600 with 131X's, as Orville Domras, Buffalo, N. Y. had 1600-127X. Handel was 1st Master—1599-133X; Fred Parker, 1st Expert—1599-139X; Weaver, 1st SS-Mk—1592-106X.

The morning mail contained one of those rare communications which really plays on the heart strings. I know of no one who has contributed more toward the development of the shooting game than the gentleman whose letter I have before me. Frank J. Kahrs long ago earned a place of honor in Shooting's Hall of Fame. While editor of *Arms and the Man*, forerunner of *The American Rifleman*, Frank produced such an interesting publication that there was no need for media such as "Random Shots" to provide "between-the-lines" interpretation. Later, his "Possibles and Impossibles" column in *The Rifleman* was a must. That was written when he was with Remington Arms. . . . I feel truly honored that Mr. Kahrs reads my material. More than that, however, I appreciate his thoughtfulness in sending a snap shot of my Dad which he took "many years ago at Camp Perry."

Those of you who have been around the shooting game for a while are all Frank Kahrs' friends and I feel certain that you will be interested in a portion of his letter. He is Secretary-Treasurer of the Clearwater, Fla., Rifle Club. . . . "I still keep up my interest in Small Bore Shooting but do all of my shooting from the bench. I shoot a Remington 37 with Johnson 8 Star barrel that Eric made for me a couple of years ago and does it shoot. I also use the 40X but my first love is the 37 with which I had much to do with its design and introduction to the shooting public. Modesty prevents me from telling you that I usually run off a 400 and from 25 to 35X's. Not bad for an 81 year oldster is it?" . . . Anyone care to challenge him to a match? The only stipulation is that you must be as young as he. While we are reminiscing, I seem to recall something about a "Wheel-Chair Match" approximately 11 years ago in which Mr. Kahrs was a participant. Remember that, Frank? I plan to return your kindness very soon by sharing a photo of that occasion with our readers.

If Random Shots seems pitched on a more thoughtful note this month, it is for a very good reason. Much serious work remains to be done on all fronts. Here in California we are faced with a firearms legislative threat two weeks before the November 3rd elections. Almost apologetically we urge non-shooters to drop their important campaign work long enough to write a letter, but they always comply. One outdoor editor wrote a good story on the approaching hearing before the Calif. Assembly Criminal Procedure Committee. The only drawback was that his article somehow became "lost" and did not appear in the home edition of Los Angeles' largest newspaper. One of my contacts found it on the newstand in a small suburb. The editor was out of town and unaware that his readers did not see his story—until I finally talked with him yesterday. He was anxious to do another story if I would send him additional material immediately, special delivery to his home. So now, I'm pushing our deadline hard.

I don't always agree with Senator Dodd, but when he charged that the nation's criminals are being coddled and pampered and said that "We've got to crack down on the kind of lenient, sentimental sentencing which has made a mockery of law enforcement," he has uncovered the source of our problem. If a conviction meant anything and if paroles weren't passed out promiscuously for good behavior while behind bars, law-abiding citizens would not continually be called upon to defend their right to bear arms.

By the time you read this, our fate will probably have been decided. Each day brings more requests for information on the Arms Control and Disarmament Agency and the direction taken by congressmen and senators regarding Public Law 87-297, which created the instrument for relinquishing our sovereignty and our arms. It is indeed heartening that so many of you have taken the trouble to write for documented facts before casting your vote. I am answering my mail as rapidly as possible. My grateful thanks for your interest and your patience.

A UNIQUE PISTOL TOURNAMENT

By William E. Peterson

Getting away with its usual fast start, the Eighteenth Annual Pistol Tournament of the Westchester County (N. Y.) Police Revolver and Rifle League put in two busy days in perfect weather September 12th and 13th.

I have called this a unique pistol tournament, since as far as I have ever heard, there is no other like it. For various reasons it is so tremendously popular that the Association can make its own rules, which when they differ from the established pro-

cedure, do so along the lines of increased fairness to the competitor, while at the same time eliminating the frustrating delays which plague most pistol tournaments.

For instance, these people have the quaint idea that a gun should go off when the shooter wants it to. There is none of this "alibi run" business that is so familiar to most pistol competitors. If a gun fails to fire it is just too bad, but nothing can be done about it. The curious result is that there are mighty few failures, all competitors knowing in advance that they better be doggone sure of their gun and ammo before getting on the firing line. Time is saved in other ways also—such as permitting no discussion in scoring targets, all such questions being settled by ripping off the target and deciding the matter back of the firing line while the match goes on unhindered.

While the 30-shot course fired is based predominantly on the standard police course and Army "L" course, there is one modification which helps move things along. This is the firing of Rapid Fire from the 25-yard line instead of from the 15-yard line as in the original course. The shooter does not have to shift from one line to the other. Probably the main reason for this difference is to minimize noise, as the 25-yard firing line is completely closed in except for the ports to shoot through, and heavily sound-proofed. After all, the range is located in a fairly well populated residential district.

As a result of the above and several other time-saving regulations which could be surprising to a stranger to this tournament, each 30-shot relay is fired in the amazingly short time of twenty minutes. There is no rush—all they have done is to cut out ordinary delays. In consequence with only a 24-point firing line, this outfit in two days puts through the incredible total of 1,034 entries, consisting of 764 individual entries, 45 4-man teams, and 45 2-man teams. I believe this must be a record among pistol tournaments.

I have said that this is a popular tournament. As a matter of fact it would probably be utterly swamped with entries except for the fact that only residents of Westchester County and the nearby town of Stamford, Connecticut may compete.

One other matter in which this tournament is different. Participation in the festivities, no matter how many matches one shoots, is covered by the princely sum of three lonely one-dollar bills. Think of that, you shooters who are used to paying three and four times that, and more, for a day's match shooting. To a shooter this could seem like one good reason for moving to Westchester County, New York.

Under the genial supervision of the Tournament Chairman, Lieut. Frank J. Waterbury, everything slid along slick as grease for the two days. Others who pitched in to keep things moving at an even pace were Patrolmen Robert Madden and Samuel Gallardi, Sgt. Albert Pellicci, and Chief Geo. E. Burrows, etc.

While there were no 300 possible scores shot, due to rapid fire being shot from 25 instead of 15 yards, some of the scores were pretty close to it.

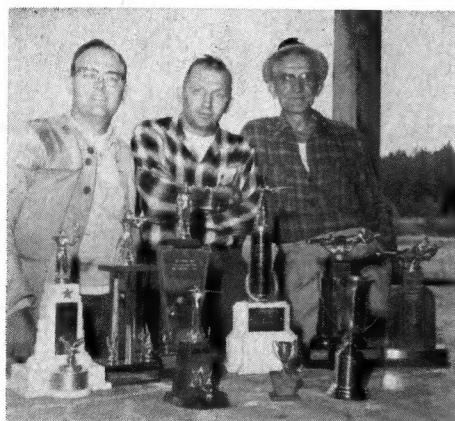
In the Police Individual .38 cal. match, with 95 entries, the three high scorers were: H. Davidson 294, Brian O'Donnell 294, and R. Mazzola 292. In the Aux. Police and Civilian .38 cal. match, with 199 entries, it was Clifford Truesdell 295, A. Mascia 295, and T. Florian 294.

Three high in the .22 cal. individual matches were: Police (51 entries) Frank Silventri 296-21x, H. Davidson 296-19x, and Robt. Madden 296-19x. Aux. Police and Civilian (210 entries) A. Mascia 297-23x, R. Ferguson 297-21x, Cliff Truesdell 297-21x, and Geo. Duck 297-20x.

Winners in the Big Bore (38-40 and larger cal.) match were: Wm. Kamp 296, Cliff Truesdell 295, and P. Mahoney 293.

The better individual score in the team matches were correspondingly high.

TOURNAMENT CIRCUIT



Winner Wm. Schlitzkus (right) and runner-up at the LaGrande smallbore match, Ray Wheeler (left) with Club Secretary Dwayne Wing in center.

OREGON SMALLBORE SHOOTING By Charles D. Leonard

On September 6th the Outdoor Smallbore season came to an exciting close with William F. Schlitzkus winning the 18th Annual Blue Mountain Smallbore Championship Match, sponsored by the LaGrande Rifle & Pistol Club, LaGrande, Ore.

The 38 competitors entered had excellent weather in which to compete. The morning started off quite cool but by the end of the first match the sun was shining and the temperature rose to around 70 degrees. The first match was a 100 yard any sight match and was fired under indoor conditions, with many possibles posted. But before the second stage of the next match (100 yards iron sights) the wind and mirage began picking up.

The 50 yard and 50 meter matches were fired under abnormal conditions, particularly for this range. The conditions became worse as the day progressed. As a closing tribute to the season, the elements decided to raise havoc with the shooters. Gusts of wind and switching mirage during the first stage of the 50 meter match stopped everyone simultaneously as though a moment of silence was requested. This lasted about two or three minutes but before it was caught, there were many an 8 and 9 shot scored.

The entire match was nip and tuck between Bill Schlitzkus of Springfield, Ore. and Ray Wheeler of Ellensburg, Wash. Bill edged Ray in the iron sight aggregate with a 795-54x against Ray's 795-46x. The Any sight aggregate went to Bill with a score of 1196-89x, while Ray settled for 1195-43x. The Grand Aggregate was decisively Bill's with a 1991-148x, and Ray tallied 1990-139x. Along with winning the aggregates, Bill retired three of the five trophies won at this match.

Elizabeth Baker of Portland, Ore. exhibited such excellent shooting that she won the high Sharpshooter trophy, Progressive Trophy representing 8 matches won, and High Lady Trophy. Her final score was 1960-82x. Although Jack Baker did not do so well as his wife in the aggregates, he won his first place awards as an expert in the individual matches.

Larson Air Force Base, Washington, was well represented, with J. Lucas winning first Master in all three aggregates with scores of 1983-107x, 1192-63x and 790-39x. P. Black won first Marksman in the any sight aggregate with 1174 and second Marksman in the Grand Agg. with 1947-64x. W. Sexton was second Marksman in the any sight agg. with 1172.

For the Grand Agg., C. Bowles, Pendleton, Ore. was 2nd Master with 1976-



Covered firing line of the LaGrande, Oregon, Rifle & Pistol Club smallbore rifle range.

103x. C. D. Leonard, Oregon City, Ore. was 1st Expert with 1978-96x and Wm. J. Schlitzkus (Bill's son) was 2nd with 1976-115x. K. Mikolas, Spokane, Wash. was 1st Marksman with 1949-82.

When I reported on the Oregon State Championship match I mentioned that Bill Schlitzkus had fired a 400-32x in the International Dewar Team Match. Yesterday (Sept. 19th) I received a letter from Mr. Claude C. Sonley, Secretary of the Yorkshire Smallbore Rifle Association, Yorkshire, England, congratulating us on our winning the 1964 International Dewar Team Match. We were fortunate to beat this team in 1962 also. The score was Oregon 3968, Yorkshire 3924.

In 1963 we did not have our state match as there was difficulty obtaining a range or club to sponsor the match. However, this year we did fire this important match and this time we won again but not by too great a margin. The scores were:

Oregon	Yorkshire
F. Schlitzkus 400-32x	C. Blake 400-24x
L. Frickey 399-28x	B. Lewis 398-26x
V. Fogle 397-28x	F. Jay 398-25x
C. Bowles 397-22x	A. Moody 396-22x
K. Dapp 397-21x	F/Lt. Aldridge 395-24x
P. Volkman 397-18x	P. Wade 394-15x
W. Toursh 396-22x	K. Goodrum 393-21x
G. Tuck 394-15x	W. Tindall 393-18x
J. Sliverira 392-18x	C. Sonley 392-15x
J. Privat 392-18x	P. Knowles 391-20x
3961-222	3950-210
C. F. Smutz—Coach	C. C. Sonley—Coach
C. D. Leonard—Captain	W. F. Tindall—Captain

Mr. Sonley mentioned in his report that his team ran into wind conditions during the match. We were more fortunate that we did not have the same conditions, but we did have our problems with the mirage. Which is worse, no one can say. Some shooters prefer the mirage over the wind while others are just the opposite in their thinking. This is what makes up the sport of competitive shooting.

We, the members of the Oregon State Rifle and Pistol Association are proud to shoot against such an excellent opponent as this English Team and are all looking forward to making the team in 1965.

PENNSYLVANIA FREE RIFLE CHAMPIONSHIP

Veteran shooters R. K. (Bob) Moore, of Claysville, Pa., became the new Pennsylvania Free Rifle Champion at the championship match held at the Murrsville Rifle Club on September 26 and 27. Firing over the challenging International Smallbore Course, consisting of 40 shots prone, 40 shots kneeling, and 40 shots standing at 50 meters distance, the new Champion finished his firing with a score of 1109. During the course of a wet, cold Sunday afternoon, Moore fired a 392 prone, a 377 kneeling, 340 standing. Barry Trew, of Bentleyville, Pa., was a close second with 1106.



Pennsylvania Free Rifle Champion R. K. "Bob" Moore shooting from the kneeling position.

Trailing in third place, among the State resident contingent, was Bill Funk of Murrsville with 1094.

The Championship Match at the Murrsville range drew 49 competitors, including 24 from out of state. Twelve junior shooters were included among the sharpshooters. The State Championship is restricted to State residents, otherwise the match was open to all competitors with trophies for the open winners.

Sgt. William Krilling of the AMTU of Fort Benning, Ga. topped the scoring with 1148, including a dazzling 399 prone, and a 368 standing, first place for that position. Jack Wirter, a West Virginia University student, was second on the open list with 1137, which included a first place 387 kneeling and a second place 358 standing. Deam Bahrman, also from West Virginia University, and the tournament's top Junior shooter, was third with 1126, his 357 standing taking third in that position. Capt. Verle Wright, AMTU, was 4th with 1121, and 4th standing with 355. Sgt. Ed Caygle, Lackland AFB, Texas, took 5th with 1119.

Other outstanding position scores are the 396 prone by Larry Wilkens, Seville, Ohio, and 380 kneeling by Sgt. Al Hannon of Lackland AFB.

Among the Junior shooters, Jack Schweitzer, Lancaster, Pa., was 2nd with 1085, one point over John Funk of Murrsville. Jean Linton, Akron, Ohio, led the distaff side with a 1077.

The match was fired in four relays, starting on Saturday morning and the fourth finishing Sunday evening. The full course of 120 shots was fired each relay, enabling the competitors to select a time most suitable for themselves. The firing line of the Murrsville range is covered and protected from wind and weather, there being a little of both during the weekend. Wind conditions varied from light breezes to occasional heavy gusts on both days. The weather started out clear and sunny, gradually becoming more cloudy, bringing on the heavy cloud cover and intermittent rains of Sunday afternoon.

NORTHEAST SPORTSMAN'S SHOOT

The Capital Rifle & Pistol Club of Montpelier, Vt. sponsored a Northeast Sportsman's Shoot (high-power rifle) on the National Guard Range at West Bolton, Vt., September 13th, with 45 competing. The course of fire was 20 shots standing at 200 yards, 10 shots rapid fire standing to sitting at 200 yards, and 20 shots prone slow fire at 600 yards, with an aggregate for the course.

The aggregate winner was James Gomo, Springfield, Vt. with 241-21V. Gomo also won the 600 yard stage with a 99-9V score. Aggregate runner-up was George Pratt, Pownal, Vt. with 241-16V. Following were Creighton Audette, Springfield, Vt.

240-22V, F. Labarre, Vergennes, Vt. 240-20V, Cecil McManis, Montpelier, Vt. 240-19V, and D. Chace 240-17V.

High Expert, Dale Rowe, White River Jct. 238-23V; Sharpshooter, J. Preston 234-16V; and Marksman, J. Merrill 220-7V.

Thomas Mansfield won the standing stage with a 99-5V score, and Darryl Stoner was high Rapid Fire with 50-9V.

MASSACHUSETTS SMALLBORE

Eric Johnson reports that the open award winner and runner-up at the Massachusetts State Smallbore Tournament at Hopkinton, September 27th, were Carl Johnson, Hartford, Conn. and Lloyd Norton, Bridgeport, Conn. We have no information about scores and do not know who the resident State Champion is.

Eric reported that there was a good sized entry and that "it was about the windiest day I've ever spent on a rifle range—anything from 20 to 50 mph at times and fishtailing from 5 to 7."

PROMOTE ALL SHOOTING

By Charles D. Leonard

Oregon State R&P Ass'n

I have just finished reading the article by Fred Hallberg and I want to congratulate him on such a superbly written thesis on "Promoting Shooting as a Recreational and Competitive Sport."

However at this time I would like to say that we here in the Pacific Northwest are also suffering from what one may term as a slow death. I had been given to understand that the smallbore game had been on a downhill drag for several years, and no one had done much about it. I am now referring to the outdoor phase of shooting. When I first returned to this sport in 1961 I had found to my amazement that there were only five (5) outdoor matches which I could attend between the months of May to September. To reach these matches I had to travel 3200 miles. After taking stock, I began talking up more matches at each tournament I would attend. One day it was jokingly suggested that I "Put up or Shut Up" by accepting the office of Outdoor Smallbore Director.

My first step was to obtain top awards for the matches I had planned. Fortunately, better than \$300.00 worth of Aggregate Trophies were donated by leading firms who believe in this sport. Considering these donations as a point of saving to a club, I still had difficulty trying to promote these matches. The Pacific Wonderland 200 Yd. Match was one and now it is on its way to bigger and better challenges. I do feel that with the follow-up after each match which you have generously printed, we are on our way uphill once again.

However, there is still one element that must be overcome. . . . the element of SEGREGATION.

WHAT HAS REALLY HAPPENED TO SMALLBORE COMPETITION ????

This is a question every smallbore shooter should ask; from the Junior up to and including the Master. Can it be the fact that distances between match areas is becoming too great or perhaps the awards are not commensurate to the cost of traveling and the ability of the competitor? These are but a few of the questions that are asked around the Pacific Northwest. This article is pointed toward the Rifle and Pistol Clubs in the State of Oregon; but particularly to those clubs in the Portland area. It is the hopes of this writer to revive the Outdoor Smallbore Match Program which is now in the category of "Old Generals" who never die, but fade away.

Recently I have been in contact with several clubs trying to promote more smallbore outdoor matches in this area for 1964. The following matches were submitted with the awards for the Aggregates being

donated by leading firms in Portland, Eugene and Oregon City. They are:

- #1 Pacific Coast Grand Prix Championship
- #2 Western Seaboard Dewar Championship
- #3 Pacific Wonderland 200 Yd. Championship

Only one (1) club . . . the Tri-County Gun Club sponsored one of the above matches . . . the 200 Yd. match; and it was a success. When approached several reasons for not accepting the sponsorship of any one match were given including the sick excuse that smallbore prone is a thing of the past, and that position shooting was showing the most interest. This remark was made by a position shooter . . . naturally.

The indoor position shooter feels that there is no sport more competitive than trying to knock out the center ring with one shot at 50 feet; while the outdoor shooter has his opinion that outdoor shooting "separates the men from the boys" because of having to dope the wind and mirage at distances from 50 Yds. to and including 200 Yds.

WHERE WILL THIS SENSELESS FEUDING END? If each and every one of us would stop and think about it, they would soon realize how foolish this **DISCRIMINATION** becomes. Particularly when we boast of our wonderful sportsmanship and ability to compete in an open and clean manner.

There are enough shooters here in the Pacific Northwest to make up a shooting congress equal to California and with each category working toward one goal; the smallbore game would restore itself challenging out-of-state competitors to compete more frequently. Also, the shooters now traveling would stay at home.

HOW CAN WE ACCOMPLISH THIS?

First we must realize that each member joined the club to which he now belongs because he or she wanted a place to shoot; meet new friends of mutual interest and automatically work with others to build up their club. He or she **IS NOT** doing this by the method of **SEGREGATION** they are following. We are all competitors regardless of whether we are indoor position or outdoor prone shooters.

Let's "**GET OFF**" each other's back and start acting like the human race we are supposed to represent and **WORK TOGETHER**. We should build our State Association by working on our personal association with each other.

Recently a printing from an address given by Donald Hilliker at the 1964 NRA Meeting in Los Angeles was received by this writer and perhaps many of you.

In this address, Mr. Hilliker points out the lack of match entries; lack of attempt to develop skills in competitive shooting, and most of all the lack of preparing the Junior shooter for his abrupt ending of instruction at 19 years of age. He asks . . . "Is this Junior ready to become a Senior Competitor?" Some are ready but how many are actually ready to compete outdoors as well as in Gallery Competition.

The instructors are maintaining an excellent schedule with training Juniors and guiding them along the path of successful and pleasurable sportsmanship. The instructor works many hard hours to produce a young shooter and needs much assistance and cooperation from not only his club; but from the parents and general public. These people who donate their time and sometimes financial aid are firm believers of **SAFE GUN HANDLING**, and producing future riflemen for both Competitive Sportsmanship, and Home and National Security.

It is my firm belief that these youngsters should be taught the basic technique of doping the elements before graduating out of the junior category. There are a

(Continued on Page Fifteen)

At last!

a match
grade
rifle at a
reasonable
price



Here is an exceptional intermediate target rifle by Anschütz, famed builders of the smallbore rifles used in international matches by more competitors and by more of the winners—than all other makes combined.

The Model 64 has many special features that add up to X-ring accuracy: a satin smooth single-shot action; trigger adjustable for pull, creep and backlash; a precision rifled and hand-lapped medium-heavy barrel. Target stock has raised cheek-piece, deeply fluted comb, checkered contour pistol grip. Beavertail fore-end has long rail with instantly adjustable sliding swivel; adjustable rubber butt plate.

The Model 64 target rifle costs only **\$75.00**. (Sights extra) Left-hand stock slightly more. Price subject to change. For **FREE** Savage catalog write: Savage Arms, Westfield 48 Mass.

Savage



ANSCHÜTZ

National Bench Rest Shooters Association, Inc.

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NBRSA MEMBERSHIP DUES:

Individual annual dues \$5.00 (includes magazine - subscription for membership term). Associate member (wife or husband, son or daughter under 18 years of age, of member in good standing—no magazine) \$2.50. Life membership, \$75.00. Annual club affiliation fee \$10.00.

PRESIDENT'S CORNER

To those who failed to attend the National Matches at Tulsa, you missed seeing various types of guns, stands, barrels, actions and what-have-you on the firing line.

Leaving St. Louis Friday evening, Sept. 11th, anxiously wishing to get to the range, I was greeted by an earlier arrival, better known as "Cowboy" Rucker and his wife, Rose. I've decided that to get to a National Match before him one must leave to arrive at the range over a week before the scheduled shoot dates. On my arrival at the range his prediction was that the .30 caliber rifles would prove superior in the Top Twenty. The dope sheet will show he knew what he was talking about.

The following two nights I spent varmint hunting on John Zink's ranch with Pokey Bonner and Art Freund. To our disappointment we drew "blanks" both nights and lost a great deal of much needed rest.

The next day I called our Annual Directors' meeting to order at 3:00 P. M. for work to be acted on that was presented to both myself and Regional Directors during the year of 1964. After hearing the past minutes and financial report read and accepted, a few items were discussed and 6:30 P. M. was before us, finding all hungry

and wanting to resume the meeting at 8:00 P. M., wishing to get all work done before the matches started. Arriving back to our meeting at 8:00 P. M. I was informed that back in St. Louis my mother (80 years old) had had a stroke and was not expected to live. Hating to leave the meeting, knowing I carried many requests and reports both in writing and in my head, I felt the call of a son's love for his mother. I quickly called the Vice-President, Brunon Boroszewski, to act in my behalf, who most cheerfully accepted and did a very good job, thus ending up as President for the coming year.

Arriving back at the motel, Dr. Nadler gave me a pep talk on fast driving and the safety of myself arriving home to assist my mother. Leaving Skiatook around 9:30, I arrived in St. Louis around 5:00 A. M. the next morning and the next time I went to bed was five nights and four days later. To answer all letters I have received from you nice people, Mother is paralyzed on the left side and 90% of her mind destroyed. Her condition is questionable at this date (Sept. 30, 1964). I wish to thank all Bench Rest Shooters for the flowers you sent—they were beautiful.

I have tape recordings of part of the meeting (one tape Brunon put in backwards) and the last part of the meeting was not recorded, due to lack of tapes. To this date I have no news of the results of the meeting, but shall pass on to you this information in the next issue of PRECISION SHOOTING.

The attendance was low—a total of 45 shooters. We must decide on what the cause is of shooters not attending. Is it because of the two National meets being too close together, or of school already started, or what?

I only wish I could give you more data on the shoot, but feel a report will be turned into PRECISION SHOOTING to get into this issue.

A new rules book will be out by the first of the year if I can in any way find it possible to accomplish this. Rules were reworded, added, and Part II will be in the new Rules book. The above was acted on during my absence, so I can give you no report at this date.

Mr. Arthur Freund has notified me he will be unable to be Chairman of the Measuring Committee after Jan. 1, 1965. I ask you Directors and members to help me find a replacement. Art has done a fine job and I feel we owe him a hand of thanks.

I wish to thank the Directors for working on all work I had placed on the Agenda. To the officers taking the office at the first of the year, I hope you will get the cooperation you need from all members. This will make your duties much easier to perform. To all you members, please give them your utmost. Our organization can only grow by all working together as one team.

I have been attending very few matches this year, but now that I am being relieved of both Regional Director of Mississippi Valley Region and President of N.B.R.S.A. I promise to be on the firing line more next year. Again, I wish to thank all members for the nice letters, cards and flowers received.

Until next month,

A. W. Walter, Pres.
N.B.R.S.A.

TO ALL NBRSA MEMBERS

From Alfred W. Walter

Due to my absence for the Annual Meeting in Tulsa, before I left I, before the presence of the Directors, assigned Director-Elect Arthur M. Freund to act in Proxy of Mississippi Valley Region during my absence, and turned the meeting over to Vice-President Brunon Boroszewski to carry on all work.

I am passing on to you a letter submitted to me by Mr. Arthur M. Freund with which, I must say, as Regional Director of Mississippi Valley representing those members, I agree. If you haven't been informed by your Regional Directors of this change I will now enlighten you, as I have word for word on the action of this particular work on recording.

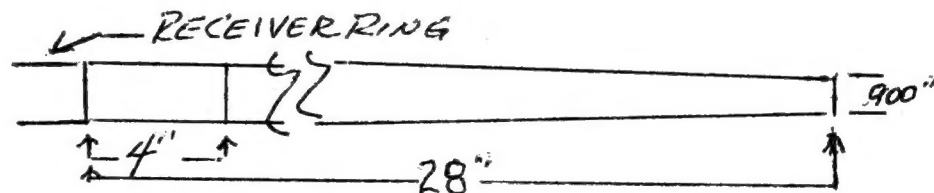
It seems to me this new rule was changed only for the benefit of Remington Arms Co. All through the discussion come the words Rem., Rem., and more Remington. As it was talked about in the preceding year to help only the person who had a barrel 28 inches long and wished to cut it off. This rule was added in the Green Rules Book by the Rules Rewriting Committee and overlooked by us Directors, who later saw that it was a new rule and not a rule only reworded for easier understanding, as our aims were in re-writing the Green Rules Book. At the Directors' Annual Meeting in 1963 at Wapwallopen, Pa., this rule was withdrawn, along with the hard rear rest on Light, Heavy Varmint and Sporter, which also had been added.

The barrel dimensions rule was again brought up this year, and after a lengthy discussion it was 6 in favor of not changing and 2 wishing to have it changed. Vice-President Brunon Boroszewski asked for a vote of hands, and more discussions and politicking went on, to result in several Directors (after hearing the Remington discussions) changing their minds to vote 6 in favor of changing and 2 against. I have, and will forward to anyone, a copy of these words from the tape.

I am enclosing a scale all clubs will have to use to measure the barrels at all Registered Matches. As many of you members have complained of clubs not measuring, weighing, or checking sandbags or rests, this, I feel, will be a much more avoided rule and the results will be a lot of griping and weakening of our organization.

I have, since the meeting, received several protests over the telephone of shooters having their guns made up to last year's rules, only to find they had sacrificed the much needed wood in stocks and metal in barrels, and forced to buy lighter scopes. The custom gunsmiths have been put in an embarrassing position of telling their customers of the requirements to meet for weight, only to find their recommendations obsolete by this new rule.

I feel the changing of this rule is not for the benefit of cutting off an over-the-counter 28" barrel gun to lighten it for weight requirements or for recrowning purposes, but only to bring baby bench rest barrels into the Sporter, Light and Heavy Varmint classes. As you well know, the three above classes are growing by leaps and bounds, so let's not be hasty, but



bear in mind our wishes are for this to carry on.

I have spoken my piece only as I feel, and will now attach Mr. Freund's letter to mine. You members are free to write to me how you feel on this, and I hope to hear this time from over 10%, please.

The maximum muzzle diameter of Sporter class, Light Varmint and Heavy Varmint class rifle barrels, effective January 1, 1965 unless revoked, are as follows:

Barrel length from receiver	Diam. at muzzle
17 inches	1.060 inch
17½ inches	1.053 inch
18 inches	1.046 inch
18½ inches	1.038 inch
19 inches	1.031 inch
19½ inches	1.024 inch
20 inches	1.016 inch
20½ inches	1.009 inch
21 inches	1.002 inch
21½ inches	.994 inch
22 inches	.987 inch
22½ inches	.980 inch
23 inches	.973 inch
23½ inches	.965 inch
24 inches	.958 inch
24½ inches	.951 inch
25 inches	.943 inch
25½ inches	.936 inch
26 inches	.929 inch
26½ inches	.921 inch
27 inches	.914 inch
27½ inches	.907 inch
28 inches	.900 inch

Mr. Freund's Letter:

Dear Sirs:

At the National meeting of the NBRSA in Tulsa this year you will no doubt remember that I, as proxy and director-elect for the Miss. Valley Region, argued and voted against changing that part of definition #3 pertaining to barrel dimensions for Varmint and Sporter rifles. I still feel that a mistake was made and therefore at this time I would like to propose the following:

"That the action taken in amending the definition of Heavy Varmint Rifle, Section 1, Part B, No. 3, by leaving out the words 'and a diameter at muzzle of not more than .900 inch' and adding to the end of said paragraph 'at 28 inches' be rescinded. In brief I propose that the barrel dimensions be allowed to remain the same as in the present rule book."

The reasons for the above are as follows:

1) According to other changes made in the same definition at the meeting it was my opinion that we wished to keep the Varmint and Sporter classes looking like guns, not miniature bench rest machines. The amended rule would allow a barrel of 22 inches to have a muzzle diameter of 1.00 inch. This is not the kind of barrel that we, in this area, want to see.

2) It was stated at the meeting that we were clearing up problems that had arisen, and plugging loop holes in the present rules. In my experience I have heard no complaints about this rule. If it was working why change it?

3) It was the express opinion of some of the directors present that the changing of this rule would harm no one since all present guns would still be legal. I believe that this change will not only anger the individual member but will harm the NBRSA. The reason is that anyone who has built a gun for next year will feel that his gun is not the equal of those constructed under the new rule. He will tend to feel that he is being taken advantage of. I feel that this will lead to many complaints.

4) The new rule will be more difficult to enforce accurately hence causing complaints from match officials as well as shooters.

In summation I would like to say that

1964 National Bench Rifle Championships

Conducted by the Tulsa Bench Rest Rifle Club, Oklahoma

45 Competitors — 30 Open Class; 15 Limited Class

TOP-TWENTY

	Class	100 yd.	200 yd.	Grand
1. NATIONAL CHAMPION				
Homer L. Culver, Va.	Ltd.	.3791	.5619	.4705
2. Brunon Boroszewski, N. Y.	Ltd.	.3842	.5667	.4754
3. Chester J. Pluth, Calif.	Open	.3563	.6300	.4931
4. Paul O. Gottschall, Ohio	Ltd.	.3598	.6819	.5208
5. Robert W. Hart, Pa.	Ltd.	.4640	.6035	.5337
6. Ralph W. Stolle, Md.	Ltd.	.4583	.6264	.5423
7. Eldon L. Stolle, Md.	Ltd.	.3333	.7540	.5436
8. Horace E. Powers, Okla.	Open	.3733	.7248	.5490
9. Bernice McMullen, Ohio	Ltd.	.3734	.7257	.5495
10. George E. Kelbly, Ohio	Ltd.	.4885	.6200	.5542
11. Cline Deere, Ohio	Open	.4788	.6531	.5659
12. Clyde E. Yockey, Pa.	Open	.5180	.6215	.5697
13. L. F. Carden, Kans.	Open	.3725	.7709	.5717
14. M. M. Oakley, Wash.	Open	.3751	.8052	.5901
15. L. S. Rucker, Ohio	Open	.4907	.7290	.6098
16. I. E. Potter, Ohio	Open	.4277	.7954	.6115
17. Larry Engelbrecht, Kans.	Open	.4262	.8334	.6298
18. Robert W. Smith, Texas	Ltd.	.3910	.8745	.6327
19. L. E. Wilson, Wash.	Open	.5308	.7425	.6366
20. Wallace E. Hart, Pa.	Ltd.	.5336	.7446	.6391

100 Yard National Champion — Eldon L. Stolle
200 Yard National Champion — Homer L. Culver

MATCH WINNERS

Sept. 16, 100 yards

Open Class

Warm-up	Dr. Sam Naddler	.245"
No. 1	Bob Stultz, Mo.	.307"
No. 2	Chester Pluth	.245"
	Larry Engelbrecht	.245"
No. 3	L. F. Carden	.281"
No. 4	Chester Pluth	.216"
No. 5	Clyde Yockey	.365"
Agg.	Larry Engelbrecht	.3762"

Limited Class

Warm-up	B. Boroszewski	.372"
No. 1	Eldon Stolle	.276"
No. 2	Bernice McMullen	.269"
No. 3	Bernice McMullen	.261"
No. 4	Roy E. Norman, Wash.	.240"
No. 5	Robert E. Smith	.317"
Agg.	Eldon Stolle	.3524"

Sept. 17, 100 yards

Open Class

Warm-up	Chester Pluth	.210"
No. 1	Walter Burger, Kans.	.276"
No. 2	Horace Powers	.180"
No. 3	Allen Hobbs, Calif.	.334"
No. 4	Horace Powers	.208"
No. 5	M. M. Oakley	.220"
Agg.	Walter Berger	.2866"

Limited Class

Warm-up	George McMullen	.285"
No. 1	Brunon Boroszewski	.218"
No. 2	Omar Rinehart, Ohio	.246"
No. 3	Eldon Stolle	.308"
No. 4	Homer Culver	.234"
No. 5	Arthur M. Freund, Mo.	.257"
Agg.	Eldon Stolle	.3142"

Sept. 18, 200 yards

Open Class

Warm-up	Horace Powers	.778"
No. 1	Chester Pluth	.839"
No. 2	Chester Pluth	1.245"
No. 3	Clyde Yockey	.816"
No. 4	L. S. Rucker	1.023"
No. 5	Chester Pluth	.565"
Agg.	Chester Pluth	.5109MOA

Limited Class

Warm-up	B. Boroszewski	.575"
No. 1	Bernice McMullen	1.013"
No. 2	George Kelbly	.998"
No. 3	B. Boroszewski	.840"

I believe we have created a problem where none existed before. I ask you if this is what we want? If not, and I hope not, please vote to leave the present rule as it is.

Thanking you for giving this proposal your serious consideration, I remain,

Sincerely Yours,

Arthur M. Freund,

Direct-elect Miss.

Valley Region

No. 4	Roy E. Norman	.888"
No. 5	B. Boroszewski	.727"
Agg.	Brunon Boroszewski	.5263MOA

Sept. 19th, 200 Yards

Open Class

Warm-up	Walter Berger	.778"
No. 1	Clyde Yockey	.839"
No. 2	Chester Pluth	1.245"
No. 3	L. F. Carden	1.415"
No. 4	Chester Pluth	.688"
No. 5	Cline Deere	.565"
Agg.	Cline Deere	.6140MOA

Limited Class

Warm-up	B. Boroszewski	.700"
No. 1	B. Boroszewski	.771"
No. 2	Ralph W. Stolle	.777"
No. 3	Homer Culver	.964"
No. 4	Homer Culver	1.050"
No. 5	Robert W. Hart	.829"
Agg.	Homer Culver	.5140MOA

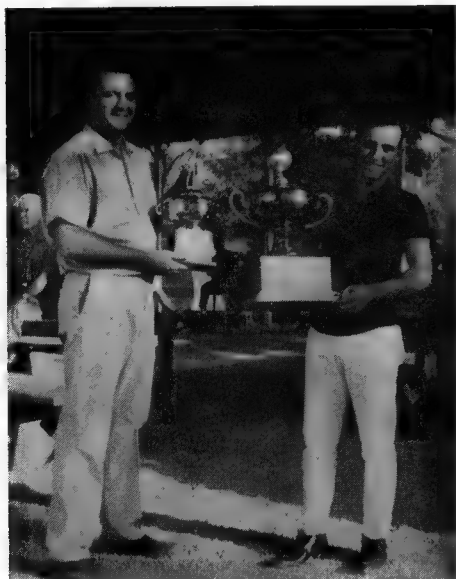


Paul O. Gottschall (right), 1963 champ, presenting the new National Bench Rest Rifle Champions, Homer L. Culver with the FIELD & STREAM Trophy, the oldest trophy emblematic of the Bench Rest Rifle National Championship.

Homer Culver, the National Champ, used his caliber .308 rifle with Hart barrel, 28" long, 1½" diam., with 14" twist, his own action, stock by Stolle, and he did his own gunsmithing. His scope was a 24X Unertl. Total weight of gun and scope was 25 lbs. His load was 48 grains of H380 powder with his own 6½S 168 grain bullets and CCI Magnum primers.

Eldon Stolle, the 100 Yard Champ, used a caliber .22-45 rifle with 28" long, 1½" diameter, 14" twist, Hart barrel, Culver action, on which his father, Ralph Stolle, did the gunsmithing and stocking. The rifle was scoped with a 24X Unertl for a total weight of 19 lbs. He fired Culver 6S 52 grain bullets with 21 grains 4198 powder and RWS primers at the 100 yard range. At 200 yards Eldon used his father's .308 caliber rifle.

(Continued on Page Twelve)



Ray Speer (left) of SPEER, Inc. and NBRSA Northwest Region Director, presents the SPEER TROPHY to 1964 National 100 Yard Bench Rest Champion, Eldon Stolle from Seabrook, Maryland.

1964 National Bench Rifle Championships (Continued from Page Eleven)

Brunon Boroszewski, runner-up to the Champ and only .0049 MOA behind, used his caliber .308 rifle with 30" long, 1 1/2" diameter, 14" twist Hart barrel on 722 Remington action, and did his own gunsmithing and stocking. The 24X B&L scope made a total weight of 42 lbs. His load was 49 grains H380 powder with 8S 160 grain bullets made in B&A dies and Federal Magnum primers.

Chester Pluth, high Open Class competitor in the championship aggregate, used two rifles. One was a caliber .222 Remington with 30" long, 1 1/2" diameter, 14" twist Hart barrel, Shilen action, gunsmithing by Hart and stocking by Puett, 36X Unertl scope, and weighing 135 lbs. In this rifle he used 23 1/2 grains Ball-C powder, his own 50 grain bullets and Remington primers. The other rifle in caliber .222 Remington Magnum had a 30" long, 1 1/4" diameter, 14" twist Hart barrel, Hart action, stocking by Puett, 30X Lyman scope and a total weight of 150 lbs. In this rifle he loaded 26 1/2 grains of Ball-C powder, his own bullets and Remington primers.

Weather during the two days of 100-yard shooting was rainy, cool and quite calm, but during the final two days, while firing at 200 yards, typical Oklahoma weather with bright sun, shifting winds and plenty of mirage from the dampened ground, caused plenty of trouble for the best of the dopesters. However there were no disqualifications due to conditions and only two otherwise; one due to trigger failure and the other from a miscount of record shots fired.

P. J. Aurand, Milroy, Pa.
Chief Statistical Officer

COMMENTS FROM BOB BERRY, Secretary of the Tulsa Club and Chief Range Officer at the shoot.

The Match Officials were: Statistician, Paul Aurand, assistant, Rose Rucker. Measurer, John Sweany, assistant Tom Gillman. Range Officer, Bob Berry, assistant, Red Cornelison. Charge of Target Detail, Jack Morgan.

Referees; Larry Engelbrecht, Bob Hart (Chairman), Allan Hobbs, alternate, J. L. Bonner.

The 45 competitors was the smallest number that we have ever had for a National Shoot at Tulsa. But what we lacked in number was more than made up for in quality.

THE WEATHER and comment on



Observers at the 1964 National Benchrest Matches seen here with Ray Speer (right) of Speer, Inc., are M. D. "Bud" Waite representing the American Rifleman and Max Thompson (center) representing Winchester-Western.

shooting conditions: On the first day, Wed., conditions were just pretty good. Overcast, but sort of a high one; cool, but not too much so—shed heavy shirts. Just a nice shooting day with nothing tricky to worry about, except a switch now and then. The top 26 men had under half-inch aggregates for the day.

On Thurs. it rained in the morning, and the target crew got fairly wet. We allowed the guns to be left just back of the benches rather than carry them through the rain back to the big shed. About 11 it sort of quit and after lunch it was gone, but remained overcast and almost a dead calm. Someone told me they heard a shooter say that evening that he just couldn't dope a dead calm—hadn't had any experience! This was strictly a 22 caliber day!

For the two-day 100 yard aggregate the 32nd ranking shooter had an aggregate of .4971.

Friday, for the start of the 200 yard shooting, as you might suspect, the wind came up. But not so bad as you have seen it at Tulsa. Actually the wind wasn't too strong; it just switched so fast they couldn't begin to keep up with it. When they went to the sighter target, it would switch before they could get back on the record target! And this is the literal truth! Light changes from high clouds made it even more interesting.

(Bob didn't mention the conditions on the last day, Sat., but judging from the match winning groups, they couldn't have improved much over Fri. PS Editor)

John Sweany gave a Site-A-Line to small group for all 4 days—if the shooter didn't have one. Horace Powers won it, but had one, so next was Chet Pluth. Ray Speer gave 500 bullets to largest agg. at 100 yds. and 500 to largest agg. at 200 yards—Henry Spencer won both!!

NEW BENCHREST RECORDS

The following new benchrest records are now official and certificates have been awarded to the holders:

Unrestricted Benchrest Rifle—5-shot group at 300 meters—6651 inch. This group was shot by Clyde Yockey, Apollo, Pennsylvania. Mr. Yockey used a caliber .219 in Hart barrel on Weber action which he gunsmithed and stocked himself. His

scope was a Unertl 24X and the complete outfit weighed over 30 lbs. His load was 28.5 grs. Ball-C powder, 54.5 gr. bullets made in Culver dies and CCI primers. This record retires that of .6735 which was made by Sam Clark, Jr. at DuBois, Pa. in 1950. Clark made his long standing record with a .25 caliber rifle.

Sporter Rifle—5-shot group at 100 yards—1707 inch. This group was shot by H. B. Reagan, Big Spring, Texas, at the West Texas Sportsman Club range in Abilene, Texas on June 27, 1964. Mr. Reagan used a 6X47 cal. in a Hart barrel (24" X .743", 12" twist) on Rem. 722 action, gunsmithed by Hart and stocked by Reagan. He used a Unertl 20X scope. The complete outfit weighed 10 lbs. 2 oz. His load was 26.7 grs. Ball-C powder, Sierra 60 gr. bullets and Rem. 6 1/2 primers.

Sporter Rifle—five 5-shot match aggregate at 100 yards—4242 MOA. This aggregate was made by Thomas E. Gillman, Hot Springs, Arkansas, at Hot Springs on April 5, 1964. Mr. Gillman used a 6X43 cal. in Douglas barrel (19" X .886" 12" twist) on Enfield action, which he gunsmithed and stocked himself. Scope was an 8X Lyman. Complete weight 10 lbs. 5 oz. His load was 20.2 grs. 4227 powder, 60 gr. Sierra bullets and Rem. primers.

Heavy Varmint Rifle—5-shot group at 200 yards—1923 inch. This group was shot by Thomas E. Gillman, Hot Springs, Ark. at Hot Springs on June 27, 1964. For shooting this group Gillman used a 22 Tomcat (his own creation) in a Hart barrel (25" X .880" 14" twist) on his own action, which he gunsmithed and stocked himself. His scope was a 20X Unertl. Complete weight was 13 lbs. 7 oz. His load was 28.5 grs. 4320 powder, 53 gr. Sierra HP bullets and Rem. primers.

Light Varmint Rifle—5-shot group at 100 yards—1735 inch. This group was fired by Robert Freund, St. Louis, Mo. at the Bench Rest Rifle Club of St. Louis range on May 16, 1964. He used a 6mm Int. in Nu-Line barrel (24" X 1 1/8" X .700" 12 inch twist) on Rem. 722 action, which was gunsmithed by Nu-Line Gun Shop and stocked by Freund. Scope was a 10X Weaver. Complete weight was 10 lbs. 6 oz. His load was 31.5 grs. of 3031 powder, 73 gr. bullets made in Bahler dies and RWS primers.

Bench Rest Match Reports

YREKA, CALIFORNIA

Twenty-two competitors fired in the Third Annual West Coast Championship Matches at Yreka, California on September 5th and 6th. The weather was cool in the early morning, but warmed to a comfortable temperature by mid-morning. The winds were not strong, but changed directions and velocity constantly. Despite the tricky winds, several new range records were established. High ranking aggregates in the various classes were:

UNRESTRICTED — OPEN (8 comp.)

	100	200	Grand
Felix Marincovich	.4414	.4368	.4391
Al Hobbs	.3702	.5554	.4628
Virginia Jones	.2984	.6610	.4797
Wally Titus		.4210	

UNRESTRICTED — Limited (7 comp.)

	100	200	Grand
Virginia Jones	.4176	.7901	.6039
Leonard Shepard	.7916	.8449	.8183
Wally Titus	.6182	1.0346	.8264
Ray Speer	.6204		

HEAVY VARMINT (17 comp.)

	100	200	Grand
Al Hobbs	.3296	.4718	.4007
Tom Squires	.3980	.6515	.5248
Wayne Davidson	.3724	.6785	.5255
John Larson	.4582	.6513	.5548

LIGHT VARMINT (8 comp.)

	100	200	Grand
Ray Jones	.5434	.6941	.6188
Earl Jacobson	.7820	.7334	.7577
Ken Jones	.5640	1.0121	.7881

Both Virginia Jones and Felix Marincovich shot 222 Magnum rifles with Hart barrels on Weber actions and both used Hollidge bullets. Al Hobbs used a 222 with Rem. action and a 219 Don with Weber action, both with Hart barrels, and shot his own bullets. Ray Jones shot a 222 Mag. in Hart barrel on Sako action, with Hollidge bullets.

Len Shepard was the only one to use a 308, this in Hart barrel on Shilen action with load of 41 grs. 3031 and Sierra 168 gr. bullets.

Over-all, five shot bullets by Hollidge, five shot their own bullets, five shot Sierra and nine shot Speer bullets (two shot bullets by different makers in different guns).

HOT SPRINGS, ARKANSAS

At the Hot Springs Gun Club's heavy varmint class shoot on their Indian Mountain Range, September 5th, Larry Beard was the aggregate winner with .3443 MOA. L. E. Cornelison was second with .4396 and A. McDonald was third with .4698.

Sec'y Bob Maddox reports; "We had a rather small turnout but everybody shot well and the match went quite smoothly. I would like to express thanks for the Hot Springs Gun Club to all the fine shooters who have traveled so far to attend our matches. It has been a real pleasure to have them at our matches, and indeed, the visitors have made our matches. We sincerely hope that we will be seeing them and many more next year."

CANTON, OHIO

The Canton-McKinley Rifle Club held their last night Varmint class match of the season on September 19th and 20th. Despite the fact that the Nationals were on the same weekend (this was a non-registered shoot), 19 shooters competed.

The aggregate score was figured on the best 5 of 6 matches. It is reported that if No. 1 match had been considered a warm-up, it would have made no difference in the ranking of the top ten shooters.

The shooting was all at 200 yards and 5-shot matches. Top ranking shooters were:

	250-25x	4703 MOA
Clem Mervis	250-24x	.4104 MOA
James Anderson	250-23x	.5057 MOA
W. C. Davidson	250-21x	.5327 MOA
Neal Waltz	250-19x	.5317 MOA
Winter		

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RICHMOND, INDIANA

Ferris Pindell reports: "We had our first, and probably last, registered bench rest match for this year at the Old Trails Rifle Club Range in Richmond on September 27th. Only five shooters participated in the match, probably due to cold, rainy weather and some just getting back from the Nationals at Tulsa. (The match was for unrestricted class, National Match Course.)

Four of the shooters shot .22 cal. all the way. Cline Deere shot .22 cal. at 100 yards and .30 cal. at 200 yards. It was sure a WINDY day!"

Ferris Pindell was 1st in the 100 yard aggregate with .3530, was 4th at 200 yards with .6550, but won the grand with .5040. Irv Potter was 3rd at 100 yards with .4950, won the 200 yard with .5318 and was 2nd in the grand with .5134. James Shepler was 2nd at 100 yards with .4902 and Cline Deere was runner-up at 200 yards with .5889.

Pindell shot Limited class rest and the others used Open class rests.

KANSAS CITY, KANSAS

Mill Creek Rifle Club of Kansas City held its final registered Heavy Varmint rifle match for '64 on September 26th, with 16 shooters from Missouri, Kansas, Oklahoma and Arkansas.

Bernie Geenens of the host club won the 100 yard aggregate with a .2798 and a new range record. Larry Engelbrecht fired the small group of .177 and was third at 100 yards and in the Grand. Horace Powers was top gun at 200 yards with .5069 and second in the Grand with .4802. Larry Beard of the Hot Springs club was second at 100 yards with .3362, second at 200 yards with .5435, and first in the Grand with .4399. His shooting buddy and new National Varmint Champ, Tom Gillman, shot the small group at 200 yards of .471.

Beard shot a 222 in Hart barrel on Weber action with 23.3 grs. of Ball-C and Sierra bullets. Powers shot his own 220 Powers Special in Hart barrel on Mauser action with 30 grs. of 3031 and B&A 55 gr. bullets. Engelbrecht shot a 222 in Hart barrel on Rem. 722 action with 23 grs. Ball-C and B&A 51.5 bullets.

The top ranking aggregates were:

	100	200	Grand
Beard	.3364	.5435	.4399
Powers	.4536	.5069	.4802
Engelbrecht	.3374	.6359	.4866
Geenens	.2798	.7273	.5035
Johnson	.4398	.5895	.5146
Freytag	.3522		
Gillman	.4218	.5439	

"Bud" Carden

WICHITA, KANSAS

The Wichita Bench Rest Rifle Club held an Unrestricted and Heavy Varmint class match on October 3rd with 11 shooting Unrestricted and 12 Heavy Varmint. Conditions were reported good, fairly calm at 100 yards, extremely windy at 200 yards.

High ranking aggregates were:

	100	200	Grand
L. F. Carden	.3384	.4519	.3951
Walter Berger	.4498	.4643	.4570
Horace Powers	.4636	.5070	.4853
N. C. Jackson	.4544		
William Starks		.4896	

(Continued on Page Fourteen)



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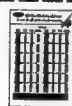
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HEAVY VARMINT CLASS

	Agg.	Cal. Action	Scope Barrel	Length Diam.	Weight Twist	Gunsmith Stocker	Powder Charge	Bullet Primer
Gerald Arnold Gillett, Pa.	.4768	222 Shilen	Unertl Hart	28 in. .900"	13 lb 7 oz 1 in 14"	Shilen Shilen	4198 21 grs.	Detsch Rem.
Ed Shilen Hyde Park, N. Y.	.4773	222 SS&D	Unertl SS&D	25 in. .850"	13 lb 8 oz 1 in 14"	SS&D SS&D	4198 20.5 grs.	SS&D Rem.
Paul Gottschall Salem, Ohio	.4789	222½ Shilen	Lyman Hart	26 in. .900"	13 lb 4 oz 1 in 14"	Shilen Shilen	4198 22.2 grs.	B&A Rem.
Tom Manganello Old Forge, Pa.	.5169	222½ Hart	B&L Hart	23 in. .900"	— 1 in 12"	Hart Hart	4198 22.5 grs.	Own CCI
Wally Hart Nescopeck, Pa.	.5228	222 Sherman	Lyman Hart	28 in. .850"	13 lb 8 oz 1 in 14"	Sherman Shilen	— —	Culver Rem.

SPORTER CLASS

Anthony Manganello W. Pittston, Pa.	.5662	6X47 Hart	Unertl Hart	22 in. .600"	10 lb 3 oz 1 in 12"	Hart Hart	H-380 28.2 grs.	Own CCI
L. S. Rucker Akron, Ohio	.5743	6mm Jet Weber	Lyman Hart	25 in. .700"	10 lb 6 oz 1 in 14"	Frost Self	Ball-C 34 grs.	Moffitt CCI Mag.
Dave Hall Warsaw, N. Y.	.6346	6X47 Shilen	Lyman Hart	24 in. .750"	10 lb 5 oz 1 in 14"	Shilen Self	4198 23.5 grs.	Detsch Rem.
Robert Hart Nescopeck, Pa.	.6584	6X47 Hart	Lyman Hart	23 in. .850"	10 lb 7 oz 1 in 14"	Hart Hart	4198 23.5 grs.	B&A Rem.
George Stannard Fair Haven, Vt.	.6669	6X47 Hart	Unertl Hart	22 in. .750"	10 lb 7 oz 1 in 12"	Hart Self	Ball-C 28 grs.	Detsch Rem.

LIGHT VARMINT CLASS

Lee Stanton Pittston, Pa.	.5828	6X47 40X	Lyman Hart	28 in. —	10 lb 7 oz 1 in 14"	Hart Self	4198 23.5 grs.	Own CCI
L. S. Rucker Akron, Ohio	.5946	6mm Jet Weber	Unertl Hart	25 in. —	10 lb 6 oz 1 in 14"	Frost Self	Ball-C 34 grs.	Moffitt CCI Mag.
Robert Hart Nescopeck, Pa.	.6799	6X47 Hart	Lyman Hart	23 in. .850"	10 lb 7 oz 1 in 14"	Hart Hart	4198 23.5 grs.	B&A Rem.
Gerald Arnold Gillett, Pa.	.7115	6X47 Shilen	Lyman Hart	26 in. .650"	10 lb 7 oz 1 in 14"	Sherman Bente	H-380 28 grs.	Stanton Rem.
Wm. Purcell Howes Cave, N. Y.	.7269	6X47 Shilen	Lyman Hart	26 in. —	10 lb 8 oz 1 in 14"	Self Self	Ball-C 28 grs.	Own Rem.

On October 3rd and 4th the South Creek Rod & Gun Club, Fassetts, Pa., held the Pennsylvania State Championship for Varmint rifles with 84 entries. There were 22 registered in the Sporter class, 21 in Light Varmint class and 41 in the Heavy Varmint class.

It rained hard during the night but Saturday morning the weather was beautiful with the temperature rising to 75° in mid-afternoon. On Sunday it was another beautiful Fall day but rather windy.

The Sporter class matches were shot first Saturday morning with Dave Hall the 100 yard aggregate winner with .4748. Immediately following the Heavy Varmint was shot at 100 yards with Wally Hart the winner with a very respectable .3750. The Light Varmint winner was Harry Bente with .3658.

In the Light Varmint class, targets were submitted for a possible new record for the smallest group of 5 shots at 100 yards by Harry Bente with .158" and Dave Hall with .157". The previous record being .1573.

Saturday night we were all entertained with some very wonderful slides shown by Harry Bente in the clubhouse, shoots held in various regions this year. The colors and details were something to behold. Besides being a very fine shooter, Mr. Bente is a very fine photographer.

Sunday morning, after playing the Star Spangled Banner, raising the flag and hearing the Lord's Prayer, we were in another fine day of shooting. The wind at times was a menace to some, as there were numerous disqualifications during the day.

Anthony Manganello was a master at

doping the wind as he won the 200 yard Sporter aggregate with .5518 and the Grand with .5662. He was followed closely by "Cowboy" Rucker with .5743 and third place going to Dave Hall with 6346. All received very nice trophies donated by the South Creek Club. Dave Hall and Tony Manganello also received nice plaques for winning the 100 and 200 yard aggregates.

In the Heavy Varmint class, Ed Shilen, shooting one of his new button rifled barrels made by Shooters Service & Dewey, Inc., won the 200 yard aggregate with .4643. The Grand Aggregate was won by Jerry Arnold with .4768, followed very closely by Ed Shilen with .4773 and Paul Gottschall with .4789. As the scores indicated, this match was up for grabs until the last bullet was fired.

In the Light Varmint class it was Lee Stanton the Grand Aggregate winner with .5828, Cowboy Rucker second with .5946, and Robert Hart third with .6799. Lee Stanton won the 200 yard aggregate with .7124, which was shot in a very stiff, shifty wind late Sunday afternoon.

The South Creek Rod & Gun Club would like to take this opportunity to thank all those who worked to promote these matches, and all those who attended the shoots during the summer. Our records show that there were some 280 entries in the five shoots held during this summer and if this is any indication of things to come, the Varmint class is here to stay.

Thanks to everyone and we hope to see you all back again next summer.

Jerry Arnold

Bench Rest Match Reports

(Continued from Page Thirteen)

Heavy Varmint

Larry Kuse	.4554	.5253	.4903
Nolan Jackson	.4904	.4984	.4944
Bernie Geenens	.5434	.5252	.5343
Larry Engelbrecht	.4088		
Don McCoy		.4406	
Marshall Johnson		.5200	

Carden shot a 222 Mag. in Hart barrel on Baucher action with 26.7 grs. Ball-C, B&A 52 gr. bullets and RWS primers. Berger shot a 222 in Hart barrel on Baucher action with 23 grs. Ball-C, Own 52 gr. bullets and RWS primers. Powers shot his 220 PS in Hart barrel on his own action with 30 grs. 3031, his own 55 gr. bullets and Rem. primers.

Kuse shot a .219 in Hart barrel on Enfield action with 28 grs. Ball-C, Bahler bullets and Rem. primers. Nolan Jackson shot a 222½ in Hart barrel on S&L action with 24.3 grs. Ball-C Sierra bullets and Rem. primers. Geenens shot a 222 in Hart barrel on Baucher action with 23 grs. Ball-C, his own bullets and RWS primers.

ST. LOUIS, MISSOURI

The Benchrest Rifle Club of St. Louis held a twilight Sporter Class shoot on October 3rd. The 100 yard shooting was done in the evening before dark, a lunch break taken, and the match finished up at 200 yards under the lights. The conditions at 100 yards were fair with little mirage but a strong shifting tail wind for the majority of the 5 groups. The conditions at 200 yards were baffling. The rapid change in temperature from day to night caused a

quite dense ground fog which made for quite a few unexplainable wild shots.

The aggregates went as follows:

	100	200	Grand
Phil Broderick	.4934 (1)	.6267 (1)	.5600
Don Kramer	.5758	.7504	.6631
A. M. Freund	.6416	.6854	.6635
Al Walter	.6094 (3)	.7351 (3)	.6722

It is interesting to note that, while shooting a consistent third at both ranges, Al Walter got slipped out in the Grand.

Phil Broderick shot a .243 D&W in a Hart barrel on Shilen action with a 20X Litschert scope. His load was 31 grs. 3031, 70.3 gr. Freund bullet and CCI primers.

Don Kramer shot a 6mm Int. in Douglas barrel on 722 Rem. action with a 10X Weaver scope, and load of 34 grs. Ball-C, 60 gr. Sierra bullet and Rem. primers.

A. M. Freund shot a 6mm Int., using a 722 Rem. action to which a barrel made and installed by Nu-Line Gun Shop was fitted. His load was 31.5 grs. 3031, 70.3 grs. Freund bullet and RWS primers.

Arthur M. Freund

Bull-Session Stuff

(Continued from Page Three)

I would also like to hear about the steel that are finding the most use in making bullet swaging dies. To one who has just begun to collect and peruse steel catalogs, this is a fascinating subject, yet it is one about which I have seen almost nothing written. Most of us know that, since die cavities are machined to near final dimensions before hardening and are then lapped to finish size, a comparatively non-deforming steel is necessary. But what can be the upper limits of this deformation? What steels have satisfied this vital requirement? At the same time, if one is going to all the trouble of making good bullet dies, he wants them to last as long as possible, and here we get the abrasion resistance factor to contend with. Or is abrasion resistance a great enough factor, with lead cores and gilding metal jackets, to cause much consideration? Is it practical to make one's insert parts—those containing the cavities—from a steel chosen for its non-deforming qualities alone and then case harden or nitride the cavities? I would like to hear from those who have had good results (or bad, for that matter) in making bullet dies and to find out what steels they have found best for this work, as well as for making the reamers.

Victor D. Fogle
527 E Street
Springfield, Oregon

Promote All Shooting

(Continued from Page Nine)

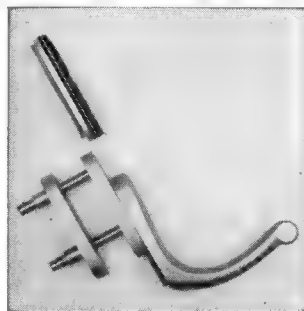
few outdoor matches being held whereby the Junior has an opportunity to display his skill or even obtain the experience of doping the wind and mirage. I feel that these boys and girls are missing the fun and most of all the challenge of outdoor shooting. There should be more outdoor matches including the juniors, and more outdoor Position and Prone matches held starting in May and ending in September. Then start shooting indoors beginning in December and ending in April. Matches such as 50 Yds., 50 Meters, Dewar and 100 Yds. can be fired to encourage the junior and allow the outdoor prone shooter an extended season. This would lead up to preparing the junior for his 19th birthday dismissal as a junior; plus give him the opportunity to discover the fun in distance shooting.

As Smallbore Director for the Oregon State Rifle and Pistol association, I ask that each one of you belonging to a club; whether a competitive shooter or a hunter consider these FACTS and do something about this national and state problem.

Act now for it will not only aid assistance to the Junior but will help guarantee winning the constant battle of Mr. and Mrs. American maintaining their Constitutional Right to own Firearms.

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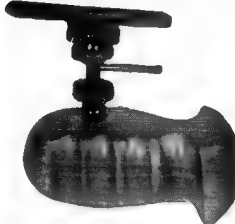
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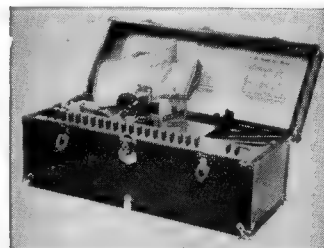
MARK III Less sights	\$210.00
MARK III with 1-8 Min Parker-Hale sights	\$245.00
MARK III with Freeland sights	\$280.00



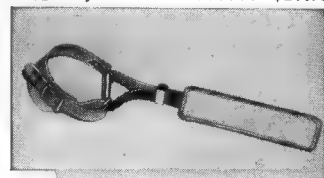
Swiss Type Palm Rest



All Angle Tripod



Freeland 30 Caliber Kit	\$13.50
48 3/4" Rifle Trunk	\$26.25
1/4 Opening small bore kit	\$20.00
Freeland 31" Accessory Kit,	
1/2 tray	\$17.75



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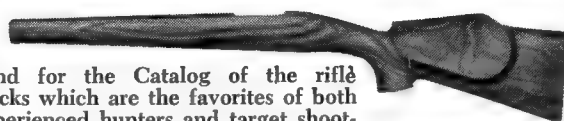
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CHANGE MAY BE NEEDED IN SPORTING WEAPON PRODUCTION METHODS

During a recent bull session at our range, one of our prominent shooters made a suggestion that I think should be further explored. He pointed out that what our shooters really need is a basic top-grade single-shot speed-lock action adaptable for experimentation, for varmint hunting, and for general field and target work. His choice of design approached the Farquharson with improvements for an independently suspended forearm and possibly increased length for stiffness and he thought it should be built in three standard sizes. His candidate for its production was the Smith & Wesson Company. S & W, he pointed out, had succeeded in maintaining a high quality production for a longer period of time than any other arms company in the United States. By that he meant that S & W had never cheapened their product for the low priced field. Only the complete finished action should be produced—not the finished weapon. These actions would then be offered to the small private gunsmith for assembly into the type and grade of weapon specified by the purchaser.

To my mind, this is an idea well worth mulling over. It follows a direction and path already faintly visible in our shooting world; that is, the day of the standard sporting shoulder weapon may be approaching an end. As our population grows, sporting fields shrink; and, as sporting fields shrink, the gun becomes a highly personalized piece of equipment rather than a simple standard tool.

Something like this has been in effect a long time in Europe and in Great Britain. Many of the basic parts used by some of the well-known gun makers on both the continent and in Britain are turned out in the rough in large scale production shops and sold to the gun makers who then convert them into beautiful works of art fitted to the user, like a well made suit of clothes. That is good sense. Modern production techniques can turn out highest quality mechanical goods at a relatively low price and these products can then be worked over and fitted by hand to meet the most exacting specifications. All cost brackets except the very lowest and cheapest can be filled by this method and I, for one, think it would be a good thing if our lowest grade cheapest arms were eliminated from the market. It may be coincidence, but it does seem to me that more of the cruder varieties of firearms are involved today in vandalism and crime than are the type of weapon used by real shooters and sportsmen.

Of course, what I am stating is only personal opinion based upon one man's observation of the shooting game. Yet I cannot help but feel that it is just as ridiculous today for the big companies to refuse to sell at reasonable prices individual parts (such as actions) as it was for them some years ago to refuse to sell individual components for handloading. The gun is now as much a personalized product of sport, be it in the field or on the range, as the flyrod is for the real flycasting enthusiast. As such, the gun is a work of art fitted to a personal need. And, by work of art, I do not mean fancy decoration but, rather, fine fitting of part to part for a specific purpose.

The availability of basic parts should also have an interesting economic effect. It would enhance the services of the good local gunsmith, some of whom would rise to national prominence because of their knowledge, skill, and workmanship. And it could well be that such a development would make the big companies more profitable than they had ever before dreamed possible.

Fred W. Hallberg

OBSERVATIONS AND COMMENTS

Whenever riflemen get together and discuss the accuracy and efficiency of their weapons, the question of cartridge and chamber design always gets attention. From a designer's point of view the chamber can mean many things other than a place to burn propellents but the production of gas and the chamber's effect on gas flow is generally considered of topmost importance. Other factors such as extraction, loading, and pressure on the bolt face can be readily provided for once we know what we really want in the way of chamber shape.

As pointed out previously in these columns, a gun is nothing more than a very simple internal combustion engine. Considered as such, combustion chamber design becomes important. This is evident by the advertising put out by engine manufacturers. General Motors tells us that their latest light diesel engine is more efficient because "the combustion chamber imparts a doughnut shaped flow to the fuel." The Mercury outboard motor people tell us that their "power-dome combustion chamber squishes the fuel-air mixture and smooths out combustion roughness." Of course, even the poorest of such engines have a tremendous built-in advantage over the gun because all elements that produce and transmit power are so much more uniform than those of the gun. The volume and composition of fuel sucked or forced, into a gas engine is almost absolutely uniform shot to shot. The piston (or bullet) is always the same regardless of the number of strokes (or shots) fired. Pressures vary with the load and propellant volume but combustion, as such, remains uniform within certain time periods even though operational change of the controls may make such time periods very short.

What should be done to improve our rifles? Rifle chambers have remained unchanged for the past 75 or more years. The very excellent Swedish 6.5 x 55 cartridge was designed in 1896. For that reason, if for no other, I believe the chamber is a ripe candidate for improvement. The same thing can be said for propellents. Fundamentally there has been no change in propellents during all these years. Such change as has been made is only modification in pellet size and shape and in surface coating. Basic chemical change has been slight. In an age when technology is advancing so rapidly that colleges must completely overhaul their programs every few years, it seems to me that some change should spill over into the firearms field. Even the gun as a whole has been little changed all these years. Such design changes as have occurred have been more concerned with fitting parts to modern manufacturing methods than to new design concepts. In many cases the old machines and methods that produced weapons fifty years ago are still in use. This fact was vividly brought out a short time ago when it was found that a quality production machine shop could turn out high grade M14 rifles at almost half the cost of the old line gun companies.

Of course economics play a part in this question of change and improvement. It is easy to make specification changes. To translate them into production at acceptable cost is more difficult. That is where we shooters come in. Our job is to tinker with and dream about problems that come to light in the pursuit of our hobby. When we find something acceptable and it remains with us a sufficient number of years, the big companies will eventually fall in line and adopt it. But stereotyped thinking by the big companies is hard to crack. Just think! It was only about four years ago that one of our major ammunition companies employed an expensive business research agency to determine the scope of hand loading and whether or not was here to stay. High-priced unimag-

inative management plus high-priced research agencies have a bad effect on profit and loss statements. However, we must thank the big companies for one thing. Had they not been so adamant in their refusal to enter the cartridge components field, we would not today have had such excellent bullet manufacturers as Sierra, Hornady, Speer, and others.

But let us dream on. If we are really to improve the rifle cartridge, we must reduce the distance from primer to bullet. Yet we must also have sufficient propellant capacity to produce required velocities at acceptable pressures. That means a short fat case. We also know that sharp abrupt shoulders raise pressures without a comparable increase in velocity. That means shoulder angles cannot be greater than a standard .30/06. But, if the cartridge is wider, shoulder angles will be longer and, probably, even more moderate than our .30/06.

There is also much room for improvement in our propellents. However, we must assume there will be little change for years to come and we shall have to do the best we can with what we have. Some people discount the importance of case shape because, they say, pressures are equal within all parts of the container when the powder is ignited. That would be true if our gas did not flow. But it does flow in the direction of the moving bullet and if case capacity is too great or the powder too slow to ignite properly much energy will be lost by pushing unburned grains out into the barrel and, in so doing, accelerate erosion at the throat. Efficient design rejects excessive case capacity.

Two present cartridges which this writer thinks are indicative of future design are the S&W .22 Jet and the French 8 m/m Lebel. The Jet has a long shoulder of the type that will probably be employed on the shorter wider cartridge and the Lebel accomplishes somewhat the same idea with a compound taper. My next .30 caliber rifle will be chambered for a cartridge employing these principles but based on a large .30 caliber belted case reduced to the capacity of a .30/06. I would guess that overall length will be slightly shorter than the .308 or 7.62 Nato. It would be even more interesting to base this cartridge on the .348 Win. but that is more difficult because the bolt face of the actions available to me is not big enough to handle the base of that cartridge in the manner I would like.

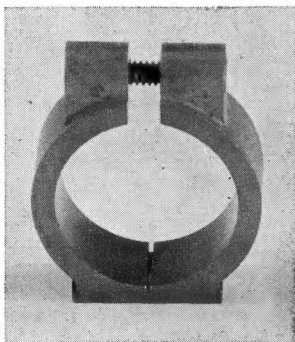
Efficient and uniform combustion requires a powder charge that is free to make some movement within the case. Compressed loads do not permit this. But, even when tested under ideal conditions, do we know that each charge is chemically the same as the other? If a fifty grain charge is divided into ten components of 5 grains each, will each five grain unit produce the same energy? This is something I do not know but it is a subject that I wish someone from the powder companies would tell us about. We now rely on averages on the assumption that, if a powder is properly mixed before using, the practical effect will be uniformity.

As I understand it, the propellant of a solid fuel rocket is simply poured and cast into the body of the rocket with a star shaped center hollow for the promotion of ignition and necessary early energy. I have often thought that complete charges of gunpowder, too, could be cast in case filling hollow cylinders—hollow from the primer to the base of the bullet—and of a sponge-like structure to create the necessary spaces for instantaneous combustion. Such charges dropped individually into each cartridge would require factory loading in the cylindrical case before the taper, shoulder, and neck are formed. Similar loading techniques were employed by British companies during the stringed cordite era. However, straight-sided cases such as we

(Continued on Page Eighteen)

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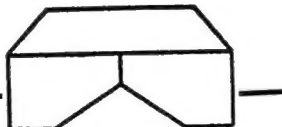
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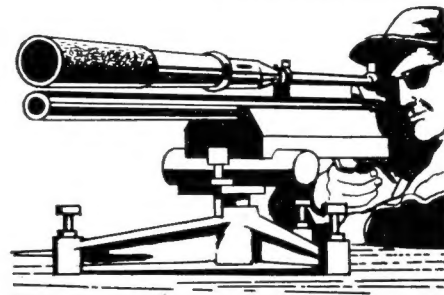
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Observations and Comments

(Continued from Page Sixteen)

use in our pistols could be readily hand loaded with such a precast propellant. Perhaps a similar cast cylinder of powder without the hollow but narrow along the sides of the case would produce the same result. In such a design, flame from the primer would have to be directed towards the sides of the case as is done today by some of our Berdan systems.

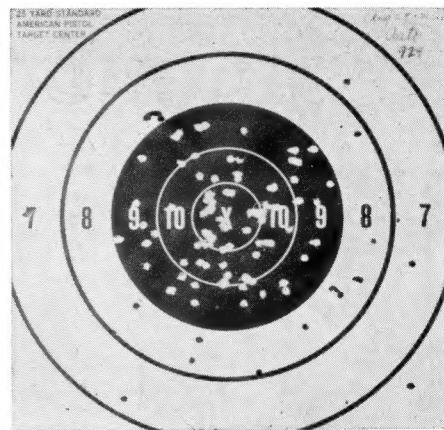
Fred W. Hallberg

BELIEVE IT OR NOT by William E. Peterson

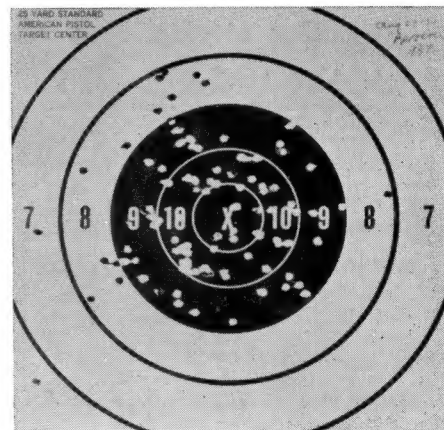
For more years than I like to count, I have strongly favored and used High Standard automatics for .22 pistol shooting, although in center-fire matches, Smith & Wesson revolvers, fired double-action, were my choice in both .38 and .45. This bit of preliminary dope is offered to indicate that the shooter in this case may be presumed to be about equally well experienced with both the .22 self-loader and, in larger calibers, the double-action revolver technique. Thus in the comparative test described below, the human element would seem to be canceled out as far as it is possible to do so.

Recently I became possessed of an S & W K-22 revolver, figuring on using it for double-action practice indoors where the heavy caliber stuff is too noisy. Soon I began shooting it fairly well, and conceived the idea of testing the revolver against the automatic in a number of 10-shot rapid fire strings, although of course as anyone would, I expected the .22 auto would easily win. Why shouldn't it, with its nice dependable 2-pound pull, heavy bull barrel, Rivers custom-carved grip that makes the gun seem part of your hand, and the consistent functioning that Hi-Standard puts into those guns?

Compared to all this the revolver was pretty far behind the 8-ball. The grip is much the same specially made hand-filling job as the auto, the action had been honed down to a velvety smoothness all the way, but the pull—WOW! The least I could get with consistent ignition was a great big eleven pounds—pretty darned heavy for accurate shooting, and rather disappointing considering that in my heavier caliber revolvers seven and a half pounds does the job nicely. Still, after a bit, the revolver scores weren't too bad, considering. So one pleasant windless day, after a little sighting in to get rid of the early morning wobbles, I put up two targets at 25 yards, and fired 20 shots in each with both guns alternating, in 10-shot strings. The result was as expected—192 for the auto, 188 for the revolver. In fact I was surprised that



Composite target for 100 shots fired rapid fire with a Hi-Standard automatic pistol, scoring 929 x 1000.



Composite target for 100 shots fired rapid fire with a Smith & Wesson K-22 revolver, fired double action, scoring 947 X 1000.

the revolver did so well comparatively. Incidentally, these and the following scores, while only fair, are about typical for this Expert class shooter.

Next day, another calm morning, I fired two more 20-shot targets. This time the result was a bit different—182 for the auto, 186 for the revolver. Oh well, accidents will happen. However they kept on happening, for the succeeding three pairs of targets gave for the auto, 185, 185, 185. While the double-action revolver came through with 190, 187, 186. Totals, out of a possible 1000, Auto, 929. Revolver, 937.

All right, I didn't believe it either, so went out and fired fifty more shots with both guns in identical conditions—and came out with results actually favoring the double-action six-gun even a bit more than before. Well, 150 shots with each gun, under similar conditions, fired by the same shooter, should give a pretty accurate indication of comparative performance, or I give up.

Remember this was all 10-second rapid fire—not slow fire, although even then I believe the revolver would have won. Only thing I can think of to explain this unexpected triumph of D-A revolver over automatic, is that the husky, heavy, ponderous 11-pound trigger pull must haul the revolver back hard into the hand, making it in effect an extension of the forearm, and thus aiding closer holding. A study of the two targets will show that the revolver produced definitely the better group, with fewer wild shots.

Admittedly, there are not many of these double-action nuts around, although occasionally you will run into one at matches. What is surprising in this case is to find the slick-functioning, 2-pound pull auto, which practically everyone shoots by preference, coming out second best. This thing requires further investigation.

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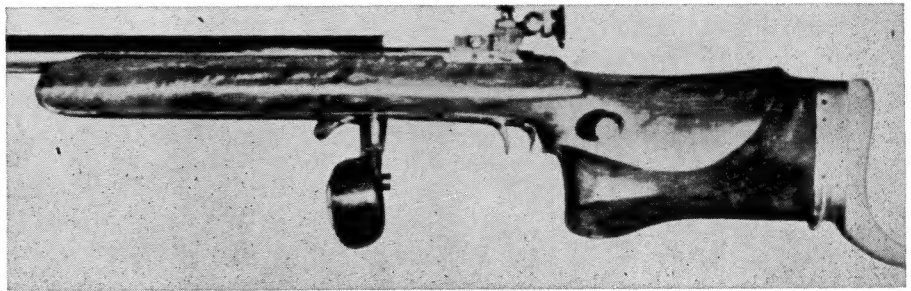
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Fred W. Hallberg

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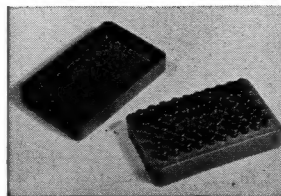
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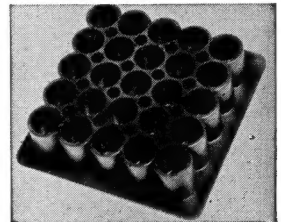
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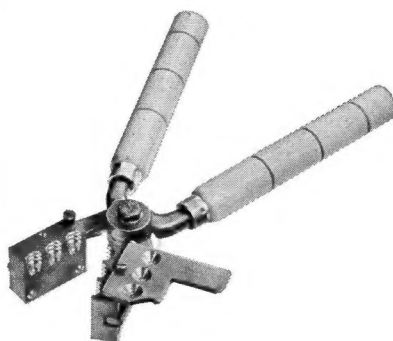
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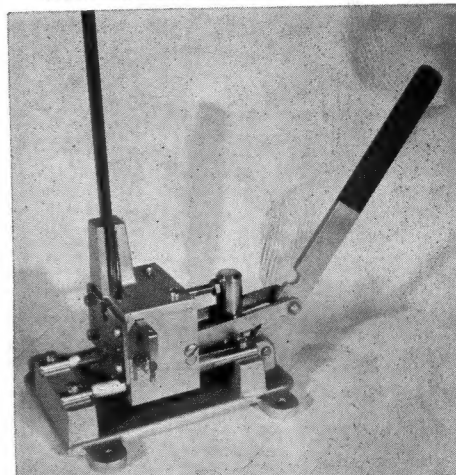
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